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UNDERGRADUATE STUDY 1971-1972 University of Illinois at Chicago Circle



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The University of Illinois
at
Chicago Circle

Undergraduate Study

1971-1972

This publication is a record of the 1970-1971 academic year
and an announcement of the 1971-1972 academic year.

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Academic Calendar

1971-1972

Chicago Circle

Fall Quarter

September 20-24, M-F
September 27, M
October 25, M
November 25-26, Th, F
December 3, F
December 6-10, M-F

Registration week
Instruction begins
Veterans' Day
Thanksgiving vacation
Instruction ends
Final examinations

Winter Quarter

December 13-17, M-F
January 3, M
February 7, M
March 10, F
March 13-17, M-F

Registration week
Instruction begins
Lincoln's Birthday
Instruction ends
Final examinations

Spring Quarter

March 20-24, M-F
March 27, M
March 31, F
May 12, F
May 29, M
June 2, F
June 5-9, M-F
June 18, Sun

Registration week
Instruction begins
Good Friday (no classes)
Honors Day
Memorial Day observance (no classes)
Instruction ends
Final examinations
Commencement

Summer Quarter

June 12-16, M-F
June 19, M
July 4, Tu
August 25, F
August 28-September 1, M-F

Registration week
Instruction begins
Independence Day (no classes)
Instruction ends
Final examinations

Urbana

First Semester

September 7-12, Tu-Sun
September 9-11, Th-Sat (noon)
September 13, M
November 24, W, 1 p.m.
November 30, Tu, 1 p.m.
December 18, Sat, 1 p.m.
January 3, M, 1 p.m.
January 15, Sat
January 17-25, M-Tu

New Student Program
Registration
Instruction begins
Thanksgiving vacation begins
Thanksgiving vacation ends
Christmas vacation begins
Christmas vacation ends
Last day of instruction
Semester examinations

Second Semester

January 31-February 6, M-Sun
February 3-5, Th-Sat (noon)
February 7, M
March 25, Sat, 1 p.m.
April 3, M, 1 p.m.
May 12, F
May 27, Sat
May 29, M
May 30-June 7, Tu-W
June 10, Sat

New Student Program
Registration
Instruction begins
Spring vacation begins
Spring vacation ends
Honors Day
Last day of instruction
Memorial Day (holiday)
Semester examinations
Commencement

Eight-Week Summer Session

June 16-17, F, Sat
June 19, M
July 4, Tu
July 17, M
August 10, Th
August 11, 12, F, Sat

Registration
Instruction begins
Independence Day (holiday)
Beginning of second four-week courses
Last day of instruction
Summer session examinations

1972-1973

Chicago Circle

Fall Quarter

September 18-22, M-F
September 25, M
October 23, M
November 23-24, Th-F
December 1, F
December 4-8, M-F

Registration week
Instruction begins
Veterans' Day (no classes)
Thanksgiving vacation
Instruction ends
Final examinations

Winter Quarter

December 11-15, M-F
January 2, Tu
February 5, M
March 9, F
March 12-16, M-F

Registration week
Instruction begins
Lincoln Day (no classes)
Instruction ends
Final examinations

Spring Quarter

March 19-23, M-F
March 26, M
April 20, F
May 28, M
June 1, F
June 4-8, M-F
June 17, Su

Registration week
Instruction begins
Good Friday (no classes)
Memorial Day (no classes)
Instruction ends
Final examinations
Commencement

Summer Quarter

June 11-15, M-F
June 18, M
July 4, W
August 24, F
August 27-31, M-F

Registration week
Instruction begins
Independence Day (no classes)
Instruction ends
Final examinations

Urbana

First Semester

September 14-16, Th-Sat

September 18, M

November 22, W, 1 p.m.

November 28, Tu, 1 p.m.

December 22, F, 1 p.m.

January 3, W, 1 p.m.

January 13, Sat

January 23, Tu

Registration

Instruction begins

Thanksgiving holiday begins

Thanksgiving holiday ends

Christmas holiday begins

Christmas holiday ends

Last day of instruction

Semester examinations

Second Semester

February 1-3, Th-Sat

February 5, M

April 14, Sat, 1 p.m.

April 23, M, 1 p.m.

May 4, F

May 26, Sat

May 28, M

May 29-June 6, Tu-W

June 9, Sat

Registration

Instruction begins

Spring vacation begins

Spring vacation ends

Honors Day

Last day of instruction

Memorial Day (holiday)

Semester examinations

Commencement

Summer Session

June 15, 16, F, Sat

June 18, M

July 4, W

July 16, M

August 8, W

August 9-11, Th-Sat

Registration

Instruction begins

Independence Day (holiday)

Beginning of second four-week courses

Last day of instruction

Summer session examinations



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of the University of Illinois

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William D. Forsythe, Jr.425½ E. Washington Street, Springfield 62701
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Perspective

The University of Illinois at Chicago Circle was activated on February 22, 1965, not as a new institution but as the successor to the Chicago Undergraduate Division, through which the University of Illinois for 19 years provided the first two years of college and preprofessional work for over 100,000 college-commuting students of the Chicago area.

In the spring of 1946 the University knew that men and women from the Armed Services would inundate the Urbana-Champaign campus. It was impossible to construct additional facilities in time to meet the demand, and restricting enrollment was undesirable. Therefore, Navy Pier, already used as a school and adaptable to the needs of a freshman-sophomore program, was leased by the Board of Trustees, and the Chicago Undergraduate Division was organized. That fall, 3800 students, three-fourths of them veterans, were enrolled and attended classes of reasonable size taught by competent faculty in quarters at least minimally satisfactory. Without the Chicago Undergraduate Division there would have been no place for most of them to go.

Although the percentage of veterans dropped slightly in 1947, enrollment rose above 4500, for as the wave of veterans moved through the freshman and sophomore years, their places were taken by their nonveteran brothers and sisters.

As the years passed, the need for a four-year campus in Chicago was increasingly evident. In January, 1961, the Board of Trustees approved the granting of baccalaureate degrees by the Chicago Undergraduate Division as soon as an adequate campus was available. The site, where the Eisenhower, Ryan, and Kennedy Expressways converge, was selected in 1961, the Chicago Undergraduate Division became the University of Illinois at Chicago Circle, and the campus was occupied on February 22, 1965.

Work for the baccalaureate is offered in the Colleges of Architecture and Art, Business Administration, Education, Engineering, Liberal Arts and Sciences, including secondary school programs in teacher education, and the School of Physical Education. The College offers degrees in elementary education; secondary school programs in teacher education are offered within the College of Liberal Arts and Sciences.

Graduate work at either or both the master's and doctoral levels is offered in seventeen disciplines, which are covered in *Graduate Study*, the catalog of the Graduate College.

The Chicago Circle Campus is located just south and west of the Loop in an area bounded by the Eisenhower and Ryan Expressways, Racine Avenue, and Roosevelt Road. The mailing address is Box 4348, Chicago, Illinois 60680. Transportation to the campus is by way of the Congress and Douglas Park trains of the CTA, which has built a subway station at Peoria Street especially to serve Chicago Circle, and by the buses on Halsted, Harrison, and Taylor Streets and on Roosevelt Road.

Financial Aid is available in the form of scholarships, loans, and part-time employment. In addition, each student who attends the University is the recipient of a type of scholarship represented by the educational subsidy provided by the General Assembly from tax funds. This large contribution toward the costs of instruction and facilities makes possible the greatly reduced charges for tuition and fees.

The Student Activities Program is carried out by many student organizations. Extracurricular activities are recognized as an important part of campus life and are encouraged as part of the broad education of the student. These groups sponsor varied activities for the benefit of their memberships and plan programs for the entire student body.

The Athletic Program consists of fourteen varsity sports—football, basketball, baseball, cross-country, fencing, ice hockey, track, wrestling, volleyball, swimming, soccer, gymnastics, tennis, and golf. This institution is a member of the National Collegiate Athletic Association and under a new ruling freshman students may participate in intercollegiate athletics. An extensive intramural sports program, for both men and women, centered on more than twenty activities, serves over 5,000 students each year. The Women's Athletic Association and Orchesis offer sports activities and dance programs for women students.

Housing. The University of Illinois at Chicago Circle was established to serve the needs of students who can travel daily to and from the campus. It is assumed that most students will be living at home with their families or, if minors, in accommodations of which their parents would approve. There are many facilities in the Chicago area that offer activities and supervision similar to those of a residence hall, for example, the Eleanor Clubs (for women), the YWCA, and the YMCA. Whether students live in these facilities or in others is a matter of personal responsibility and/or of agreement between students and their parents.

The Auxiliary Services Office of the University of Illinois at Chicago Circle assists faculty, staff, and students in finding housing by maintaining a file of available rooms and apartments for rent and houses for rent or sale. This listing service is available Monday through Friday, from 8:30 a.m. to 4:45 p.m. in Room 704 of the Chicago Circle Center, Ext. 663-5058. Landlords are responsible only for a pledge of nondiscrimination on the grounds of race, religion, or national origin. A listing is removed when there is evidence that the pledge has been violated. However, the University does not

inspect the premises nor verify the accuracy of the statements made by the owners at the time of the referral.

Cars are used by the students as personal requirements permit. Parking lots at the University are self-sustaining and self-liquidating; hence, there are no free lots. Fees for parking are 50 cents each time a vehicle is parked; parking fees for the quarter are \$15 for students, faculty, and staff. (These fees are subject to periodic review and change.)

The Division of University Extension conducts and sponsors a number of educational programs for adult students not in residential programs. The facilities at Chicago Circle are used for extension programs including:

Extramural classes in upper division and graduate courses; both credit and noncredit courses are available. Call 663-8560 or 663-2623 for further information.

Correspondence courses for undergraduate credit only. Write the Division of University Extension, University of Illinois, Urbana, Illinois 61801 for further information.

Professional development courses in social work offered in cooperation with the Jane Addams Graduate School of Social Work. Call 663-7096 for further information.

Short courses and conferences offered in a variety of subject-matter areas. Call 663-7729 for further information.

Correspondence and Extramural Study. Credit for correspondence courses taken through the University of Illinois and other fully accredited institutions may be allowed, but only on approval of the dean of the college concerned. After matriculation a student may, with the approval of the dean of his college, count toward his degree as many as 90 quarter hours of credit earned in extramural courses and/or correspondence study, under the following conditions:

1. If he completes all the remaining requirements for the degree in residence at the University, or
2. If he presents acceptable residence credit for work done elsewhere and completes the requirements needed for his degree in residence at the University. In all such cases he must be in residence for the senior year (three quarters of not less than 45 quarter hours).
3. University of Illinois correspondence and extramural courses are not counted toward satisfying the minimum residence requirements for the degree nor are they considered as interrupting University residence.
4. A resident student enrolled for courses must obtain approval of the dean of his college to enroll concurrently in correspondence courses.
5. A student is not permitted to register in more than three correspondence courses at one time.
6. A student who has been dropped from the University of Illinois for poor scholarship must obtain the recommendation of the dean of his college before completing his application for admission to correspondence work and before completing registration for an extramural course.

A student dropped from another collegiate institution is considered for admission to correspondence study only on recommendation of the proper authorities of the institution from which he was dropped.

A student who has completed three years in residence at the University and has earned a minimum of 135 quarter hours may do all or part of his senior year in extramural or correspondence study or in attendance at another accredited college or university if he meets all of the college requirements for a degree.

Registration as a Visitor. The privilege of attending classes as a visitor is granted on and after the first day of instruction and only by the instructor of the class with the approval of the dean of the college concerned. Registration forms may be obtained from the Records Counter of the Office of Admissions and Records. Visitors are not permitted in laboratory, military, or physical education classes.

A visitor is not allowed to write an examination (including a proficiency examination) for course credit nor to participate in class activities.

A registered student on a full-fee schedule or a person who is a permanent, nonacademic employee of the University does not pay a visitor fee. See *Tuition and Fees*.

Other University of Illinois Facilities in Chicago include the College of Medicine (including the School of Associated Medical Sciences), Dentistry, Nursing, and Pharmacy and the Health Sciences Division of the Graduate College which are located in the West Side Medical Center.

Information may be obtained from the University of Illinois at the Medical Center, 1853 W. Polk Street, Chicago, Illinois 60612, or by calling 663-7000.

The Library

William B. Ernst, Jr., A.M., Director of the Library
 Giles B. Robertson, M.A.L.S., Head, Public Services Division
 Louis A. Schultheiss, M.A., Head, Technical Services Division
 Glenn R. Scharfenorth, M.A.L.S., Assistant to the Director

Professors: William B. Ernst, Jr., A.M.; Marie A. Rapp, B.A.L.S.; Giles B. Robertson, M.A.L.S.; Louis A. Schultheiss, M.A.

Associate Professors: Robert J. Adelsperger, M.S.; Aivars Aistars, M.A.; Harriet K. Barlow, M.S.; Aline Fairbanks, M.S.; Richard R. Seidel, M.L.S.; Arnold S. Wajenberg, M.A.L.S.

Assistant Professors: Marjorie Bengtson, M.S.; Donald Draganski, M.A.L.S.; Beth Alleman Hamilton, M.A.L.S.; Dorothy W. Ivy, M.L.S.; Martha Kester, M.S.; Linda Tzeng Lee, M.S.; Mary Lynn McCree, M.A.; Yuri Nakata, M.A.; Gladys C. Odegard, M.A.L.S.; Glenn R. Scharfenorth, M.A.L.S.; Cynthia Steinke, M.S.; Raminta Svipas, M.A.; William D. Thrasher, M.A.L.S.; Joyce Werner, M.A.

Instructors: Peter Anderson, M.S.L.S.; Mary A. Bamberger, M.A.; Richard Barton, M.A.L.S.; Jennifer Blumenthal, M.L.S.; Dit Chan, M.S.L.S.; Richard Cruce, M.L.S.; Michele Floersch, M.A.L.S.; Deirdre A. Ford, M.L.S.; Harry L. Frudd, M.A.L.S.; Janice Hall, M.L.S.; Barbara J. Hycnar, M.A.L.S.; Bozica Ivanovich, M.A.; Connie McCarthy, M.A.; Gail McShane, M.S.L.S.; Marvin O. Meier, M.A.L.S.; Alan J. Schrader, M.M.; Virginia Stewart, M.A.; Ghada H. Talhami, M.A.

Assistants: Vida Marija Biciunas, B.A.

The Library of the University of Illinois at Chicago Circle, which consists of the Main Library and a divisional Science Library, affords resources for students in all curricular areas and provides constantly growing collections of materials for current and projected graduate programs and for faculty research. Strong collections are available in American radicalism, British radicalism, British trade unionism and Fabianism, Chicagoiana, inland waterways—Mississippi River and Great Lakes—black studies, antislavery, black literature, Sierra Leone manuscripts, and Chicago authors. As of July, 1970, Library holdings included more than 365,000 books and bound periodicals, 154,000 government documents, 49,000 maps, and an extensive and expanding collection of microfilmed materials. Currently, the Library receives more than 5400 periodicals. The addition to the Library, completed in 1968, increased seating capacity to 3200 and book capacity to 500,000 volumes. Students have full access to books and other materials shelved on open stacks.

The Main Library

All books, journals, and periodicals except those in the fields of chemistry, biology, geology, and physics are housed in the Main Library. This building also houses the administrative offices, the Technical Services Division, and the Public Services Division, which includes the Reserve Book Room, main Circulation Department, Reference Department, Curriculum Library, Audio Center, Documents Section, and Special Collections.

The Reference Collection includes encyclopedias, handbooks, indices, bibliographies, and* specialized reference tools. Reference Librarians are available at the Reference Desk between 8:30 a.m. and 6 p.m. to assist faculty and students. The Microforms Collection contains more than 32,000 items of microfilm, microcards, and microfiches and the necessary reading equipment. It is staffed by a microforms clerk who assists in the location and use of these materials. Phonodiscs and tapes, listening rooms, and listening equipment are available in the Audio Center.

The Documents Section houses United States, United Nations, and Illinois state and municipal documents and provides reference service for these materials. Special Collections, the Manuscript Collection, and the University Archives contain rare books, manuscripts, and other primary source materials of a historical nature for reference and research.

Science Library

The Science Library (3rd floor, Science and Engineering South Building), which was opened in 1969, houses all monographs classed in biology, chemistry, geology, and physics (Library of Congress classifications QC—QR) and selected monographs in science-related and general reference classes; complete runs of periodicals in the above disciplines; abstracts and index journals covering the pure science periodicals; selected government documents used more frequently by science than nonscience patrons; and reserve materials for 300 or 400-level courses in biology, chemistry, geology, and physics.

English Resource Center

The English Resource Center, sponsored and operated by the Department of English, provides tutorial service and individualized instruction for students who wish to improve or reinforce their composition skills. Tutors diagnose writing problems and suggest ways for a student to overcome a deficiency that may impede his academic performance. Students in the freshman composition program may seek individualized help in solving those writing problems that cannot be dealt with in the rhetoric classes. The facility also affords an opportunity for undergraduate English-education majors and graduate teaching assistants to gain professional experience at the Center, located in Addams Hall and open from 9 a.m. to 4 p.m., Monday through Friday.

The Computer Center

Recognizing that large-scale electronic computers are now in widespread use as a research tool in nearly all scholarly disciplines, the University has established a Computer Center that is charged with administering a facility to meet the educational and research needs of the University.

The present equipment at the Computer Center includes an IBM 360 Model 651 computer with 524,288 bytes of .75 microsecond core storage and 1,050,176 bytes of 8 microsecond core storage. In addition to this facility, there are medium-speed remote job entry stations, which allow jobs to be submitted to the main computer facility from remote locations, an extensive conversational time-sharing system with typewriter consoles located throughout the campus, and an IBM 1800 process control computer with 32,768 words of 2 microsecond core storage.

The staff members of the Computer Center teach courses in programming and numerical analysis in cooperation with the Department of Mathematics and the College of Engineering. The staff also assists other departments in utilizing the equipment for both teaching and research throughout the campus.

The Office of Instructional Resources (OIR)

A comprehensive and coordinated media service is offered by this office to assist faculty members in using instructional technology in the classroom.

It provides these services through consultative divisions—Course Development and Programmed Instruction—and operational divisions—Campus Services, Film Availability Center, Instructional Materials Production, Film Making, Television Production, and Television Engineering. The Office also provides media support for administrative functions, community organizations, campus groups, professional meetings, student activities, academic courses in broadcasting, and Chicago Circle Broadcasting, a student organization.

Programmed Instruction helps to locate and try out programmed materials applicable to courses at Chicago Circle and aids in the development of programmed materials that faculty and supporting staff produce. *Course Development* analyzes instructional tasks and assists the faculty in stating objectives, designing measuring instruments, planning instructional sequences, and validating instructional effectiveness.

Campus Services loans audiovisual equipment to faculty and staff for classroom and other University functions. The *Film Availability Center* arranges rental or purchase of commercial films and filmstrips and maintains the OIR film collection. In its graphic arts studio and photographic laboratory, the *Instructional Materials Production Center* produces art work, visual aids, and camera-ready materials for publication. *Film Making* produces academic films to explore their potential for innovative and effective use. *Television Production* produces and distributes televised lessons for courses and videorecords teaching presentations, campus events, and interviews. *Television Engineering* supports the work of all OIR divisions, designs systems to meet departmental program requirements, and maintains the OIR closed-circuit television system.

Honors Programs

Programs for superior students are offered in several categories at Chicago Circle beginning in the freshman year. Opportunities for applicants with superior records vary from one college to another because of the comprehensiveness of the curricula offered at the University of Illinois. In the main, a student classified as superior has special advisers and enters special courses or sections of courses as a freshman and as a sophomore; as a junior and a senior he is encouraged to participate in special programs for majors in his department. These programs usually include individual work, seminars, and, in some cases, a senior thesis.

The Edmund J. James Scholars are selected from each freshman class entering the University of Illinois and from the currently enrolled freshmen and sophomores. A group of superior students, the James Scholars are named in honor of one of the University's most distinguished presidents. The James Scholars have available to them resources of the University not normally utilized by the average college student. Honors courses that are consistent with the student's superior ability and that challenge his intellectual development are being made available at an increasing rate; hence, the program offers unusual opportunities for an able and industrious student and provides an excellent background for graduate and professional study. A James Scholar is expected to carry at least one honors course every quarter when such courses are available to him. A James Scholar may be dropped from the program at his own request or for inadequate scholarship.

Although no monetary award is presently given to James Scholars, most are eligible for one or more of the scholarships that are available through national, state, or University sources; hence, James Scholars who need financial assistance should apply for monetary scholarships.

Seniors in Illinois high schools who have demonstrated high academic potential are eligible to apply for admission to the James Scholar Program. Applications from students in high schools outside the state are also considered. Students who have already been graduated from high school are eligible as entering freshmen; students who were not initially chosen as freshmen may be admitted to the program later. The final selection of James Scholars is made on the basis of high school grades, performance on aptitude and achievement tests, other test scores, and the recommendation of high school principals and counselors. Students in residence are chosen on the basis of their performance in college and the recommendations of their instructors.

Further information about the James Scholar Program and an application for designation as such may be obtained by addressing the Director, University Honors Programs, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

Academic Honors

Recognition for superior academic achievement at Illinois is given by the University and by the college and department in which a student is enrolled.

To be considered for academic honors in any quarter, a candidate must complete 12 academic hours exclusive of required physical education, basic military science, courses in which he has excused or deferred grades (except in an honors course), and courses completed by an examination for which "pass" is recorded.

The Honors Day Convocation annually gives public recognition to superior undergraduate students. The printed program for this convocation lists those students who have been on the Dean's List of their colleges for at least three of the four quarters since the last Honors Day Convocation. If a student has been in residence all four quarters, he must have a cumulative grade-point average of 4.000 (B) or more in addition to being on the Dean's List for three of the four quarters.

The names of new freshmen or of transfer students who enter in the fall quarter will be included if they have been on the Dean's List for the fall and winter quarters preceding the Honors Day Convocation.

Transcripts prepared for these students will carry the notation, "Honors Day Recognition, 19--."

Edmund J. James Scholars who have maintained since the last Honors Day Convocation the academic record required by the James Scholar Program will also be listed in the Honors Day program. The transcripts of these students will carry the notation, "Edmund J. James Scholar, 19--."

The Dean's List for the colleges and divisions is composed each quarter of those full-time students who have an average of B (4.000) or better in all courses, exclusive of basic military science and required physical education. This list is posted in the college offices and is sent to the Office of Public Information for distribution to the press.

Graduation with Honors

The Chicago Circle Senate and the Board of Trustees establish the criteria under which students are awarded departmental, college, and University honors.

Department Honors (Departmental Distinction) may be awarded if the student has met the criteria established by the department in which he completes his major and by his college. His diploma will carry the designation Distinction, High Distinction, or Highest Distinction, as appropriate.

General College Honors are awarded the student recommended by his dean by virtue of a sufficiently high scholastic average and the fulfillment of scholastic and other conditions determined by the college from which the student will be graduated. His diploma and his transcripts carry the notation of such an award.

Graduation with College Honors benefits the student when he is being considered for a graduate fellowship, an unusual job-placement, or some other competitive opportunity.

The Book of Academic Honors contains the names of those students who have at least a 4.500 cumulative average, from college entrance through the quarter prior to graduation, for all work (exclusive of basic military science and required physical education) taken at the University and who are in the top 3 percent of the students in their college who will be graduated with them. A transfer-student candidate for listing in the Book of Academic Honors must have earned 60 or more quarter hours at Illinois and have an Illinois cumulative average and a total cumulative average as high as the lowest average listed for those honors candidates in his college who have completed all their work at Illinois.

Additional prizes and awards are given to both undergraduate and graduating students who have meritorious records.

Honor Societies

Alpha Lambda Delta

Membership in this national honor society is open to all freshman women who meet the qualifications established by the National Council of Alpha Lambda Delta. To be eligible, a candidate must be a full-time student who has attained a 4.5 grade-point average at the end of her first quarter, or a 4.5 cumulative average within the first two or three quarters of her freshman year.

Phi Eta Sigma

Membership in this national honor fraternity is open to all freshman men who meet the qualifications established by the National Grand Chapter of Phi Eta Sigma. To be eligible, a candidate must be a full-time student who has attained a 4.5 grade-point average in his first academic quarter or a 4.5 cumulative average within the first two or three quarters of his freshman year.

Phi Kappa Phi

Founded in 1897 (University of Illinois chapter in 1933), Phi Kappa Phi is an honor society for juniors, seniors, and graduate students. Faculty members are also elected to the extent of ten each year.

The society proffers membership to students of high caliber who meet its requirements:

For juniors, a cumulative grade-point average of 4.75.

For seniors, a cumulative grade-point average of 4.50.

For graduate students, successful completion of the preliminary examination, no more than two B grades, and no grades below B.

Awards, Prizes, Scholarships, Grants in Aid

Alpha Kappa Psi Scholarship. Awarded to the high ranking male student in business administration.

Alpha Lambda Delta National Council Award. Made to the highest ranking senior in the chapter.

Lydia E. Parker Bates Scholarships. For students in architectural engineering, architecture, art, landscape architecture, and urban planning; amount varies.

Bell Honors Award. Each quarter, the graduating student who has attained the highest overall grade-point average in the College of Engineering is cited for this award and his name is engraved on the brass locomotive bell that was brought to Chicago on February 10, 1951, for the observance of the Illinois Central's 100th birthday; the bell was presented to the College of Engineering by the Illinois Central Railroad.

Albert Bellamy General Cash Scholarships. For students in any curriculum; \$150 to \$400 each.

Henrietta Curtis Hill Braucher Memorial Scholarships. From a bequest in the will of the late Ralph W. Braucher. Amount varies.

Thomas R. Bump Grants In Aid. Up to \$300 per year; to assist underachieving and underprivileged ghetto students.

Carson, Pirie, Scott & Company Grants In Aid. For designated employees of Carson, Pirie, Scott & Company; usually in the amount of tuition and fees.

Chicago Circle Physics Scholarship. Provides limited financial assistance to students of at least junior standing in one of the physics curricula; awarded upon recommendation of the Physics department.

Edward M. Cohon and Associates Prize. For students in architecture.

Bertha L. Compton Memorial Scholarship. For a young man or woman of good character who is not a member of a fraternity or a sorority. The recipient must agree to repay to the fund as soon as he conveniently can; \$100 to \$400.

Patricia Ann Counce Memorial Scholarship. A grant, in the amount of tuition and fees up to \$500, for a woman student of disadvantaged background who intends to enter the field of social work.

Henry Dubin Memorial Prize. For students in architecture.

Ernst and Ernst Annual Achievement Award. For a student in accounting, selected by the accounting faculty on the basis of scholarship, ability, and potential as a professional accountant; \$500.

B.B. Freund Award. For excellence in chemistry.

Winifred Geldard Annual Award. Made to a student majoring in economics who has a cumulative grade-point average of 4.25 or better. Scholarship, ability, and potential determine the selection of a candidate; \$400.

The Gordon Lee Goodman Award for Distinction in Undergraduate Studies in History. Friends and relatives of the late Gordon Lee Goodman, associate professor of history at the University of Illinois at Chicago Circle, have established a fund in his memory "to support excellence in the undergraduate program in history." Annually the Department of History at Chicago Circle designates at least one and not more than four Gordon Lee Goodman Scholars in History. The student must have attained or be about to attain senior standing, must be a major in history, and must have demonstrated excellent scholarship in the discipline. Designation as a Gordon Lee Goodman Scholar in History carries a stipend that will be paid from the income of the memorial fund. The Department of History maintains a permanent record of all who have been named Gordon Lee Goodman Scholars in History and will identify students so named in all appropriate University announcements and publications.

Roscoe E. Harris Award. For excellence in physics.

Dr. Hartwell C. Howard Memorial Scholarships. For premedical and pre dental students; \$250 to \$500.

Illinois Congress of Parents and Teachers Scholarships. For students preparing to teach. Recipients must be enrolled in a teacher education curriculum; \$200 to \$400.

Industrial Scholar Awards. Juniors and seniors with high scholastic achievement in the College of Engineering are eligible for these cash awards, funded by a number of industries in the Chicago area.

Robert E. Kennedy Scholarships. For students interested in the foundry field. An applicant must demonstrate financial need and must be of good character, good health, a citizen of the United States and enrolled in a mechanical, electrical, or other engineering curriculum related to the foundry industry. A candidate must show laboratory proficiency and scholastic achievement in subjects allied with the foundry field, thereby indicating a potential promise for work in that industry; amount varies.

A. M. Kinney and Associates Scholarship. For a student enrolled in the College of Architecture and Art; \$250.

Lindsey Ter Bush Memorial Scholarship. Awarded to a student in any curriculum; amount varies.

Link Belt Educational Scholarships. Derived from the income received from Link Belt Company stock given to the University of Illinois Foundation by an anonymous donor. Preference is given to students enrolled in engineering or the commerce curricula; \$350 to \$1,000.

Wensel Morava Scholarships. For young men and women between 17 and 22 years of age and of good health and good character. Applicants must be members of a church or Sunday school and must agree not to join a fraternity or sorority during their first two years as recipients. Applicants also must agree to assist, as alumni, a student with his or her expenses at the University if they are financially able to do so. Preference is given to students of Czechoslovakian descent; \$100 to \$600.

National Council of Jewish Women Scholarship. Awarded annually to a junior or senior in the College of Liberal Arts and Sciences. The student must be concerned about current social issues in the United States and must be preparing for a career related to constructive dealing with such issues. Preference will be given to applicants residing in Evanston or Niles Townships; \$400.

Calvin Barnes Nicholls Memorial Scholarships. For male students at any class level in any field of engineering; \$350 to \$1,000.

LaVerne Noyes Scholarships. Awarded to students who are direct descendants of American veterans of World War I; tuition and fees.

John W. Page Foundation Grants In Aid. For students in financial need who do not meet scholastic requirements for awards from other scholarship funds; amount varies.

The Louis Pasteur Award. Presented annually, for excellence in biological sciences, by the Honors Committee of the Department of Biological Sciences

to a graduating senior who has demonstrated excellent scholarship in biology and outstanding initiative and creativity in the exploration of a specialized research problem. The award carries a stipend of \$150, specifically designated for the purchase of books.

James D. and Clara Phillips Scholarships. General cash awards for students in any curriculum; \$150 to \$200.

Arthur D. Pickett Memorial Scholarship. Established by friends, relatives, and colleagues of the late Professor Pickett; \$200.

Raffeld Family Scholarship. Awarded annually to a student majoring in the Department of Speech and Theatre; \$200.

Regensteiner Corporation Scholarships. Awarded annually by the Regensteiner Corporation as a good-neighbor gesture; three scholarships of \$300 each.

Gretchen Johanna and Paul Charles Schilling Scholarships. For students in any curriculum; maximum of \$500 each.

Theodore R. Schlader Memorial Scholarships. For students in architecture, architectural engineering, electrical engineering, or other engineering fields; \$300 each.

Emerson F. Schroeder Awards. For students in any curriculum. One or two annual awards; from \$150 to \$300 each.

John S. Schweppe Scholarship. For a student enrolled in the College of Business Administration; amount varies.

Frederick D. Secor Memorial Scholarships. For students in electrical engineering; \$200 to \$300 each.

Alice D. Taylor Grants In Aid. For undergraduate students who demonstrate financial need; amount varies.

University Club Foundation of Chicago Scholarships. For students in any curriculum.

University of Illinois Foundation General Cash Scholarships. Supported annually by gifts to the University of Illinois Foundation; \$100 to \$600.

Ernest C. Van Keuren Award. For excellence in the humanities.

Leon Weisberg Memorial Scholarship. Established in memory of a former student at the University of Illinois at Chicago Circle and awarded to a junior or senior majoring in architecture; \$400.

Women in Construction Scholarships. Given annually by two women's organizations to junior or senior men or women who are enrolled in architecture or engineering; covers tuition, fees, books, and supplies.

Etta and Laura Beach Wright Scholarships. For students in any curriculum; two scholarships of \$250 to \$300 each.

Leigh F. J. Zerbe Scholarships. For students in civil engineering who are also enrolled in military science; maximum of \$500.

Note: Small scholarships, in varying amounts, that are used primarily as "matching" funds for Educational Opportunity Grants, are provided from a fund supported entirely by individual donors.

The Reserve Officers' Training Corps

The principal objective of the college-level Reserve Officers' Training Corps program is to develop commissioned officers for the Army Reserve and the Regular Army. It is specifically designed to enable potential leaders to prepare themselves for effective service in the Army and also offers individuals training in developing the essential qualities of leadership required for success in either a civilian or a military career.

Participation in the college-level R.O.T.C. program is offered on a voluntary basis to qualified male students. Requirements for enrollment are:

1. United States citizenship. An alien may pursue the course if he presents written evidence of his intent to become a citizen.
2. Classification as a full-time student.
3. Ability to qualify for appointment as a second lieutenant before the candidate is 28 years of age.
4. Physical qualifications for a commission.

A student entering the University after successfully completing military training in high school or in a preparatory school that has an accredited Junior Division R.O.T.C. program will be entitled, upon enrollment, to such placement as may be determined by the Professor of Military Science. However, in no case will this placement exceed the first year of the Basic Course.

Instruction is offered through a four-year and a two-year program. The four-year program consists of the Basic Course (the first two years) and the Advanced Course (the last two years). The two-year program consists of the Advanced Course and prior attendance at Basic Summer Camp. Both programs include attendance at Advanced Summer Camp between the junior and senior years. Cadets are issued uniforms, textbooks, and equipment necessary for the R.O.T.C. program.

The Basic Course. Freshmen normally devote two hours a week to military instruction, which consists of one hour of theory and one hour of leadership laboratory. In addition, the cadet must enroll in a non-military course in one of the following categories: effective communications, science

comprehension, general psychology, or political development and political institutions. This course may be one required for graduation by the cadet's college. Sophomores normally devote three hours a week to military instruction—two hours of class and one hour of leadership laboratory.

The Advanced Course. All cadets who have successfully completed the Basic Course, meet the physical and academic requirements, and pass an officer-qualification test and a physical examination are eligible for selection by the Professor of Military Science for the Advanced Course. A cadet selected to enroll in the Advanced Course without prior enrollment in the Basic Course must successfully complete the Basic Summer Camp before such enrollment and have the approval of the Professor of Military Science.

A subsistence allowance of not less than \$50 per month is paid to each cadet in the Advanced Course except during attendance at summer camp, when he is paid one-half of the pay rate of a second lieutenant on active duty with less than two years of duty. Travel to and from camp is at government expense. Meals, housing, medical care, uniforms, and all equipment are also furnished while at summer camp.

Commissioning. Upon successful completion of the Advanced Course and completion of the degree requirements, cadets will be commissioned as second lieutenants in the United States Army Reserve, and may be offered a commission in the Regular Army. A student may select from the following list the branch of the Army in which he desires to serve:

Adjutant General's Corps	Infantry
Air Defense Artillery	Medical Service Corps
Armor	Military Intelligence
Chemical Corps	Military Police Corps
Corps of Engineers	Ordnance Corps
Field Artillery	Quartermaster Corps
Finance Corps	Signal Corps
Transportation Corps	

Deferment from selective service is granted until completion of the R.O.T.C. program to those cadets who are qualified and are approved by a deferment board composed of military personnel and civilian faculty. If they maintain the required standards, students will retain their deferment throughout the course in military science.

Further information on the program is obtainable by calling 663-3452 or by visiting the Military Science Department, Room 205, Roosevelt Road Building.

Hospital-Medical-Surgical Insurance

All students enrolled and in attendance at Chicago Circle are covered by this insurance for which they pay a fee of \$7 per quarter at registration. Eligible dependents of insured students (spouse and/or unmarried dependent

children under 19 years of age) may also be insured if the student makes application to the University Insurance Office, 427 University Hall within the first 10 school days of the quarter.

Students enrolled in the spring quarter but who will not attend during the summer quarter may elect to take the insurance for the entire summer quarter by making application to the Insurance Office between May 15 and the tenth day of instruction in the summer quarter. The insured student's eligible dependents may also be included in this coverage.

To provide continuous protection, coverage will extend from the beginning of a quarter through the first day of classes for the next quarter. See the policy certificate for beginning and terminating dates of coverage.

Claims must be initiated in the Insurance Office, Room 427 University Hall. See also *The Hospital-Medical-Surgical Insurance Fee*.

The Talented Student Program for Illinois High School Seniors

Upon completion of the junior year in high school superior students who can meet University requirements may attend University classes for college credit in one or more of the four quarters at Chicago Circle or they may enroll for college credit in extramural courses or in correspondence courses offered by the Division of University Extension. See *Correspondence and Extramural Study*. Each case is considered individually, and the Director of Admissions and Records, the dean of the college concerned, and the department offering the course must concur in the high school's recommendation as the condition for acceptance. See 1, 2, and 3 below.

Ordinarily, such work taken at the University of Illinois should not be used to accelerate the high school work of a secondary-school student but should be used as a means of broadening and enriching the student's educational program. These students are expected to complete all high school courses required for graduation. The courses taken at the University by superior high school seniors are over and above the regular secondary-school curriculum.

Grades and course credits are recorded on the student's permanent University of Illinois record and appear on any official transcript issued to or for him. If the student enters the University after graduation from high school, the courses are credited toward University graduation if they are applicable to the chosen degree program. For applications and information for prospective students for this program of study, inquiry should be made to the Director of Admissions and Records, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

Students applying for admission to extramural or resident courses under the provisions of this program should arrange for the following materials to reach the Office of Admissions and Records within the deadline periods established for other admissions:

1. A recommendation from the high school principal, specifically endorsing the student for admission to a particular course or courses during the time he is also carrying a full high school schedule.

2. A completed application for admission including the \$15 nonrefundable application fee.
3. An official copy of the high school transcript covering all work thus far completed in high school, including a record of courses in progress (if applicable) and the most recent rank in class. This transcript should be accompanied by any available test scores on such examinations as those conducted by the College Entrance Examination Board and the American College Testing Program (ACT). However, these tests are not required.
4. The applicant's own statement of his belief that he is qualified to undertake college-level work, and an indication of the specific course in which he wishes to enroll.

Correspondence Study for High School Students

High school students who wish to pursue correspondence study should write directly to the Division of University Extension, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680, for their application instructions. Inquiry should be made at least two weeks prior to the beginning of any session in which they wish to enroll. For the summer months, applications should be submitted no later than the middle of May.

Proficiency Examinations for Enrolled Students

Each quarter the University gives proficiency examinations, similar to regular quarter examinations, in courses ordinarily open to freshmen and sophomores. Proficiency examinations for Rhetoric 101 and Rhetoric 102 are scheduled regularly. In other subjects the student must obtain the consent of the head or chairman of the department concerned. Proficiency examinations in more advanced undergraduate subjects may also be given if the head or chairman of the department recommends and the dean of the college concerned approves. There is no fee for these examinations.

The grade given in proficiency examinations is either "pass" or "fail" but a student does not receive a "pass" unless he has made at least the equivalent of a C. Neither grade is included in the computation of the student's average, and no official record is made of a "fail."

A student who passes a proficiency examination is given the amount of credit toward graduation regularly allowed in the course if the course is acceptable in his curriculum. However, if such credit duplicates credit counted for his admission to the University, it is not allowed. Proficiency examinations are given only to:

1. Persons who are in residence at Chicago Circle.
2. Persons who, after having been in residence, are currently registered in a correspondence course at the University of Illinois.
3. Persons who are degree candidates at the University and need no more than 15 quarter hours to complete their degree requirements.

4. Persons enrolled at one University of Illinois campus who wish to take an examination being given at another campus. They must secure an Application for Concurrent Registration from the Office of Admissions and Records.

Proficiency examinations may *not* be taken:

1. By students who have received credit for more than one quarter of work in the subject in advance of the course in which the examination is requested.
2. To raise grades or to remove failures in courses.
3. In a course the student has attended as a listener or as a visitor.

A proficiency examination is not considered an interruption of residence for graduation, nor is credit earned in this examination counted toward satisfying the minimum requirement toward the degree if the last 45 quarter hours must be earned in residence.

The Academic Year

The academic year consists of three quarters (Chicago Circle and Medical Center) or two semesters (Urbana). Requirements are generally stated in terms of full-time programs.

Requirements for Graduation

Regardless of the college and curriculum in which he is enrolled, each student must fulfill these specific requirements if he is to be graduated:

1. He must meet the admission requirements for the requested curriculum.
2. He must remove all deficiencies in entrance credit.
3. He must demonstrate that he is proficient in written English by earning passing grades in Rhetoric 101 and Rhetoric 102 or by passing a proficiency examination or the equivalent. A transfer student may be certified by the Office of Admissions and Records as having been exempted without credit from the equivalent of Rhetoric 102 while previously attending a fully accredited institution.
4. He must earn six quarters of credit in physical education unless he is a transfer student with 90 or more quarter hours of transfer credit, is a veteran, or the University Health Service recommends a waiver on physical grounds. Registration in R.O.T.C. does not exempt a student from the physical education requirements.
5. He must fulfill the general education requirements of a *minimum* of 9 hours in the humanities, 9 hours in social science, and 9 hours in natural science. However, the Colleges and Divisions are authorized to increase these minimum requirements. Consult the graduation requirements of the Colleges and Schools for variations. These general education courses, which must be taken in approved sequences, determined in consultation with the appropriate college office, provide a broad educational base for the major and minor (Liberal

Arts and Sciences), for a field of specialization (Business Administration), for the selected option (Art and Architecture, Engineering), or for work in the College of Education and the School of Physical Education.

6. He must meet all of the graduation requirements of the college and curriculum in which he is enrolled.
7. He must earn the required minimum cumulative grade-point average of 3.000 (C), or higher if prescribed in his curriculum, in all work offered for the degree and in all work taken at the University of Illinois.
8. He must satisfy the residence requirement: Either the first 135 quarter hours or the last 45 quarter hours of University work must be taken at Chicago Circle. University of Illinois correspondence and extramural courses neither apply to satisfaction of the residence requirement nor interrupt residence.

For the specific college or school requirements that must also be met, see the appropriate chapters in this Catalog.

Degrees

A degree from the University of Illinois is awarded by action of the Board of Trustees on recommendation of the appropriate College and Senate. Degrees are conferred four times a year, at the end of each quarter. The student receives the degree in a stated curriculum. The graduation requirements in effect for a curriculum at the time of the student's admission to it become his graduation requirements unless he elects to meet revised degree requirements that subsequently may apply to that curriculum.

Approval of any necessary substitutions in graduation requirements rests with the college in which the student is enrolled.

The degree for each major is stated, together with the degree requirements, in the appropriate college section of this Catalog.

Quarter Hours

A University quarter hour represents one classroom hour of fifty minutes weekly for one quarter in lecture or recitation, and either the necessary preparation time or a longer time in laboratory or other work. It is expected that most students will spend two hours preparation for one hour per week of lecture or recitation. Each University quarter hour of credit is thus understood to represent at least three hours of the student's time, and the credit value of a course is calculated in quarter hours on that basis. The number of quarter hours allotted each course is listed immediately after the course title in the "Courses of Instruction" section. "English 101. Introduction to Poetry. 4 hours." is an example. The number of quarter hours earned by the student determines, during his undergraduate period, his classification within the University:

- 45 quarter hours—sophomore standing
- 90 quarter hours—junior standing
- 135 quarter hours—senior standing

Note: 180 quarter hours constitute the minimum required for a degree. The required number of hours varies within the colleges and schools and curricula. The student should refer to the section of this Catalog covering his college and curriculum to determine the hours requirement for his particular degree. His college office will also provide this information. To convert semester hours to quarter hours, multiply by $3/2$; to convert quarter hours to semester hours, multiply by $2/3$. For example, 45 quarter hours equal 30 semester hours.

The Grading and Grade-Point Systems of the University

Each student seeking a degree should thoroughly understand the meaning of grades and symbols and the grade-point value of each grade:

<i>Grades</i>	<i>Equivalent</i>	<i>Grade Points per Hour</i>
A	Excellent	5
B	Good	4
C	Average	3
D	Poor but passing	2
E	Failure	1
Ab	Failure because of absence from final examination without excuse.	1

Symbols (not included in computation of average)

W—Withdrawn from course without penalty (no grade).

Df—Grade deferred (graduate courses and independent study courses only).

S—Satisfactory U—Unsatisfactory

Used in graduate thesis research courses and graduate courses given for zero credit.

P—Pass F—Fail

Used only in courses taken under "Pass-Fail" option. See *Pass-Fail Option* in the College of Liberal Arts and Sciences.

In—Incomplete grade with an approved extension of time to complete the final examination or incomplete course work. An incomplete must be removed by the end of the student's second quarter in residence following that in which the incomplete was incurred, or, if the student is not in residence, by the end of one year.

Pass—Used for proficiency examinations and special examinations.

Fail—Used for special examinations.

Computing the Grade-Point Average (for applying college probation and drop rules). Multiply the number of hours for each grade by the weight, add the products, and divide by the total number of hours. For example:

<i>Grade</i>	<i>Hours</i>	<i>Weight</i>	<i>Grade Points</i>
A	4	5	20
B	6	4	24
C	5	3	15
	<hr/> 15		<hr/> 59

The grade-point average is 59/15 or 3.933.

Electives

The terms "restricted elective" and "free elective" must be understood thoroughly if errors in scheduling are to be avoided.

Restricted Electives. While they differ from required courses, which must be taken by all students in a given curriculum, some electives are nevertheless restricted in scope and pertain to an area within which limited choice is permitted. For example, electives in general education are restricted to approved sequences.

Free Electives. After the University and the college or school requirements for graduation have been fulfilled, the student may still need to enroll in additional courses to earn the minimum number of hours needed for his degree. These additional hours are earned by enrolling in courses classified as free electives for those for whom they are not required. The value of free electives lies in their potential enrichment of the student's total education.

Transfer and Withdrawal

Transfer to and from Urbana-Champaign is governed by specific regulations. See *A Readmission Applicant*. Since Urbana-Champaign is on the semester system and Chicago Circle is on the quarter system, such transfer is most easily made at the end of an academic year. A student at Chicago Circle who intends to transfer to Urbana should write to the Office of Admissions and Records, University of Illinois, Urbana, Illinois 61801, and request an application for admission. A student at Urbana-Champaign who wishes to transfer to Chicago Circle may secure the appropriate application at the Office of Admissions and Records at Chicago Circle.

Admission to the Colleges at the Medical Center (Graduate, Medicine, Dentistry, Nursing, and Pharmacy). Application must be made on official application blanks obtained from the Office of Admissions and Records of the University of Illinois at the Medical Center, 1853 W. Polk Street, P.O. Box 6998, Chicago, Illinois 60680.

Withdrawal from the University is also governed by specific regulations that the student should observe to protect his academic standing. Failure to

do so will result in the grade in each course in which he is registered appearing as Ab (absent) on his record. Withdrawal initiated during the final ten days of instruction requires submission of a petition in addition to the application for readmission if a student subsequently wishes to return to the University.

A student who has been charged with an offense that may result in disciplinary action may not officially withdraw from the University until the hearing of his case has been conducted by the appropriate disciplinary committee.

Withdrawal to Enter Military Service. If withdrawal occurs during the first five weeks of instruction, the student does not receive any academic credit. If withdrawal occurs during the sixth to eighth weeks (inclusive), he will receive one-half credit in those courses in which his grades are C or better at the time of withdrawal and W (withdrawn without penalty) in those courses in which his grades are below C. After the eighth week, full credit is allowed for all courses in which he is earning C or better, and W is recorded for courses in which he is receiving grades below C.

The above regulations are effective *only* if the student goes on active duty within ten days after the withdrawal, and it is his responsibility to present proof of that fact. The most effective way of presenting such proof is to have the personnel officer of the unit to which he is assigned certify to the University the date of his assignment to active duty.

For regulations governing refunds to the student who enters Military Service, see *Refunds*.

Admission to the University

As a state-supported, comprehensive university, the University of Illinois seeks to provide a higher education for those who will profit from an intellectually challenging program. The admission requirements are designed to identify those who possess the scholastic ability and maturity needed to succeed in and benefit from such an atmosphere.

A qualified applicant seeking admission as a full-time degree candidate may enter any college or school of the University of Illinois at Chicago Circle (with the exception of the College of Architecture and Art) at the beginning of the fall, winter, or spring quarters. Beginning-freshman applicants for the College of Architecture and Art are admitted only at the beginning of the fall and spring quarters. Students whose first registration is in the summer quarter are not automatically eligible to continue in the fall quarter; they must apply separately for that quarter and meet full admission requirements. See *Admission to the Summer Quarter Only*.

Dual Enrollment. Under certain circumstances, students at Chicago Circle may enroll for a limited number of hours in courses offered at the City Colleges of Chicago and, conversely, City College students may enroll at Chicago Circle. Students registered at Chicago Circle should inquire about this reciprocal arrangement at the Office of Admissions and Records; students registered at the City Colleges should inquire at the Registrar's Office of their college.

A student enrolled for the fall semester at a semester-system institution may apply for admission to the winter quarter at Chicago Circle if he is carrying no more than 6 semester hours; unless he wishes to return to his City College campus for his spring semester, he need not apply for dual enrollment.

Concurrent Registration at campuses of the University of Illinois is also permissible. A student enrolled at Chicago Circle or at the Medical Center may obtain an Application for Concurrent Registration at the Office of Admissions and Records of his primary campus.

Admission Requirements

A *Beginning-Freshman Applicant* must meet two sets of requirements: the general University admission requirements and the requirements of the college or school he wishes to enter. See *Requirements for Admission to Undergraduate Study*. General University requirements state that the applicant must:

1. Be at least 16 years of age. A 15-year old applicant who meets all other admission requirements may petition for admission.
2. Be a graduate of an accredited high school.
3. Rank in the upper half of his class at graduation or qualify through a sufficiently high score on the American College Test (ACT) or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board. Nonresidents of Illinois must rank in the top quarter of the high school class. See *Residence Classification*.
4. Present 15 units of credit, including those specified in *Requirements for Admission to Undergraduate Study*.

A unit represents one academic year of high school work that consists of 120 sixty-minute periods in the classroom. Two hours of work requiring little or no preparation outside the classroom are considered as having the same value as one hour of prepared classroom work. Fractional credits of less than $\frac{1}{2}$ unit are not accepted. Less than 1 unit of work is not accepted in a foreign language, elementary algebra, plane geometry, physics, chemistry, or biology. The units that meet general University requirements and college or school requirements may be selected from the following groups:

- A. *English*. A minimum of 3 units, including English 5 and 6 (junior year). Only courses in the history and appreciation of literature, composition (including oral composition when given as a part of a basic English course), and grammar count toward the 3 units required for admission to all curricula.
- B. *Foreign Language*. The requirement for admission to a curriculum that requires a foreign language is fulfilled by 2 units in any one foreign language taken in an accredited high school. Alternatively, the language requirement for admission may be fulfilled by passing entrance examinations for 2 units in any one foreign language regularly taught in the University. Less than 1 unit is not accepted.
- C. *Mathematics*. A minimum of 1 unit each in algebra and plane geometry is required for admission to all curricula; however, some curricula require additional mathematics. General mathematics or other courses in mathematics may be accepted in lieu of algebra and plane geometry where the content of the course is essentially the same as that ordinarily included in algebra and plane geometry as determined by the Department of Mathematics at the University of Illinois. If such courses are not equivalent to the prescribed algebra and plane geometry courses or to more advanced courses, they will be accepted as miscellaneous credit.

- D. *Science.* Astronomy, biology (or botany and zoology), chemistry, geology, and physics are acceptable. General science will not be accepted as a unit of required science but will be counted as an elective in satisfying the required total of 15 units of acceptable credit.
- E. *Social Studies.* Government, commercial or economic geography, economics, history, philosophy, psychology, and sociology are acceptable.

Credit for work completed prior to the ninth grade is accepted by the University if it appears on the transcript of an accredited high school and is certified by the principal to be for a course equivalent in quality and quantity to the course ordinarily offered in that high school. Such credit usually applies to elementary algebra and foreign language; however, it might apply to any subject.

A Transfer-Student Applicant, one who, prior to applying for admission to Chicago Circle, has completed, with passing or failing grades, 18 or more quarter hours (or 12 or more semester hours) of university-level work must meet all the requirements for beginning freshmen (except those for high school rank and test score) and must have achieved a minimum transfer grade-point average of 3.250. See *The Grading and Grade-Point System of the University*.

Exception: A resident of Illinois whose average is 3.000 or above but is less than 3.250 may petition for admission. His petition must be approved by the dean of the college he wishes to enter and by the Director of Admissions and Records. A nonresident of Illinois whose scholastic average is less than 3.250 will not be admitted. See *Residence Classification*.

Some of the colleges have established higher requirements for admission to and for continuation in certain curricula. See *Requirements for Admission to Undergraduate Study*. All transfer grades for baccalaureate-oriented work are used in computing the transfer student's average.

A student transferring to the University who was dropped from a previous collegiate institution for disciplinary reasons must submit a petition to the Director of Admissions and Records, who will forward the petition to the appropriate agency.

A Readmission Applicant, a former student at the University of Illinois who has previously attended any of the three campuses of the University as a regular student, will be considered for readmission on the basis of his status at the time he left the University, any college work he has completed elsewhere since his last attendance at the University, and the capacity at Chicago Circle.

A student who did not complete at Chicago Circle the quarter immediately preceding the one in which he wishes to enroll is considered a "former student." If he wishes to enroll in the fall quarter, the previous spring quarter is the "immediately preceding" quarter unless that quarter was used as the student's Off-Quarter Vacation. In that case, if he was enrolled in the summer quarter, it would be the "immediately preceding quarter."

A former student who left the University on academic-drop status, regardless of whether he has attended another collegiate institution in the interval, or who withdrew during the final ten days of instruction of a quarter, must petition the dean of the college concerned when he applies for readmission.

A former student who left the University on clear status or on probation but has attended another collegiate institution from which he was dropped or where he has earned a scholastic average below 3.000 may be readmitted to the University only upon approval of his petition by the dean of the college concerned.

Scholastic probation at the University of Illinois may not be cleared by attendance at another institution except by special action of the dean of the student's college.

A former student who was dropped for disciplinary reasons must submit a petition to the Director of Admissions and Records, who will forward the petition to the appropriate agency.

A Foreign Student (one who resides outside the United States of America) may apply for admission by presenting credentials substantiating his superior scholastic achievement and his official certification either by the educational institution issuing the document or by a local or United States government official. An applicant whose native language is not English must take an English proficiency test even though he may have attended an institution or institutions where some or all of the instruction was presented in English. See *Foreign-Student Admission Procedures* for information about filing an application.

An Irregular-Student Applicant is a person holding a Bachelor's degree who wishes to continue study by registering in an undergraduate college. To be admitted to this classification, a student must obtain the approval of the dean of the college he wishes to enter and must fulfill the undergraduate admission requirements. The appropriate application and petition forms may be obtained in the Office of Admissions and Records.

Residence Classification of an applicant is determined on the basis of information given on his application and other credentials. Fees are assessed in accordance with this determination. If the student believes he has a legitimate case for change of status, he may, by a petition filed with the Office of Admissions and Records, request a change.

Petitions will be considered *within 30 days* from the date designated in the official University calendar as that upon which instruction begins for the quarter for which the fee is payable. However, if nonresident tuition was not assessed on or prior to that date, the claim for refund may be filed *within 30 days* after the nonresident charge was assessed and the student was given notice of its assessment. If the student expects to ask for a change of residence classification, he should request that the change be made prior to registration.



Requirements for Admission to Undergraduate Study

Colleges and Curricula	Minimum Scholastic Requirements		Subject Requirements	Minimum Number of Units
	High School Rank	Transfer Average		
ARCHITECTURE AND ART Architecture ¹ (All Programs)	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	3.250	English Algebra Plane Geometry Trigonometry One Foreign Language One or more units in each of the following for a total of Science (except General Science) Social Studies	3 2 1 ½ 2 4
Art (All Programs) History of Architecture and Art			English Algebra Plane Geometry One Foreign Language One or more units in at least two of the following for a total of Foreign Language (in addition to the two units required) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 1 2 5
BUSINESS ADMINISTRATION¹ (All Programs)	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	3.250	English Algebra Plane Geometry One Foreign Language Science (except General Science) Social Studies	3 2 1 1 2 2 2

Applicants who do not meet the requirements of a college and/or curriculum may be considered for admission if their high school record indicates superior ability.

EDUCATION Curriculum in Teacher Education (Elementary)	Residents: Upper $\frac{1}{2}$ or sufficiently high test scores. Nonresidents: Top $\frac{1}{4}$	Under 90 hours: 3:300 90 hours or more 3:500	English Algebra Plane Geometry One or more units in at least three of the following for a total of Foreign Language (at least two units in the same language) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 7
ENGINEERING¹ (All Programs)	Residents: Upper $\frac{1}{2}$ or sufficiently high test scores. Nonresidents: Top $\frac{1}{4}$	3:250	English Science (except General Science) Mathematics (including work in Algebra, Geometry and Trigonometry) Additional units from the following for a total of Social Science Additional English Additional Science (except General Science) Additional Mathematics Foreign Language	3 1 3 5
LIBERAL ARTS AND SCIENCES Curricula: Administration of Criminal Justice, General*, Occupational Therapy, 2, 3, Medical Record Administration, Medical Technol- ogy, Preprofessional curriculum in nursing, Prepharmacy. *For majors in this curriculum, see Academic Majors	Residents: Upper $\frac{1}{2}$ or sufficiently high test scores. Nonresidents: Top $\frac{1}{4}$	3:250	English Algebra Plane Geometry One Foreign Language One or more units in at least two of the following for a total of Foreign Language (in addition to the two units required) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 2 5

¹ Applicants who meet the quantitative mathematics requirements but do not present specific units in advanced algebra and trigonometry may be considered to have met these requirements if they present other courses in mathematics which have algebra and plane geometry as prerequisites.

² Limited program only

³ Special Requirement: Recommendations from the University Health Service and the Director of Occupational Therapy Curriculum (Medical Center).

Colleges and Curricula	Minimum Scholastic Requirements		Subject Requirements	Minimum Number of Units
	High School Rank	Transfer Average		
Teacher Education (Secondary) Curricula: Biological Sciences, Chemistry, Earth Sciences, English, French, Geography, German, History, Mathematics, Physics, Political Science, Russian, Sociology, Spanish Speech.	Residents: Upper $\frac{1}{2}$ or sufficiently high test scores. Nonresidents: Top $\frac{1}{4}$	Under 90 hours: 3.300 90 hours or more: 3.500	English Algebra Plane Geometry One Foreign Language One or more units in at least two of the following for a total of Foreign Languages (in addition to the two required) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 2 5
Preprofessional Curricula: Dentistry Veterinary Medicine		3.500		
Curriculum in Chemistry ¹ Curriculum in Physics ¹		3.250.	English Algebra Plane Geometry Trigonometry One Foreign Language One or more units in each of the following for a total of Science (except General Science) Social Studies	3 2 1 $\frac{1}{2}$ 2 4

PHYSICAL EDUCATION² Curricula Physical Education for Men Physical Education for Women	Residents: Upper $\frac{1}{2}$ or sufficiently high test scores. Nonresidents: Top $\frac{1}{4}$	Under 90 hours: 3.300 90 hours or more: 3.500	English Algebra Plane Geometry One or more units in at least 3 of the following for a total of One Foreign Language (at least two units in the same language) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	
				3
				1
				1
				7

¹ Applicants who meet the quantitative mathematics requirements but do not present specific units in advanced algebra and trigonometry may be considered to have met these requirements if they present other courses in mathematics which have algebra and plane geometry as prerequisites.

² Special Requirement: Recommendation from the Director of the School of Physical Education.

Substitutions for and Exemptions from the Admission Requirements

Entrance Examinations. Students who do not meet the high school subject requirements, or who are not high school graduates, or who have been graduated from an unaccredited secondary school may remove these deficiencies by passing examinations specified by the University of Illinois.

General Educational Development Tests. The high school level General Educational Development Tests (GED Tests) cover the following subjects: English, mathematics, social studies, and natural science. Successful completion of the tests satisfies the following admission requirements:

1. English and social studies subject requirements.
2. High school graduation.
3. Validation of credits earned in and graduation from an unaccredited high school.
4. Establishment of rank for a person who has not been graduated from high school.

Completion of the tests does *not* satisfy the algebra-geometry requirement or the science requirement. Credit in those subjects must be presented from accredited sources.

The General Educational Development Tests may be taken by persons in these categories:

1. Persons 19 years or older who have not been graduated from high school.
2. Persons, regardless of age, who have not been graduated from high school, who have been out of high school for one year, and who have written approval of the Director of Admissions and Records.

The University of Illinois does not accept credit granted through the General Educational Development college-level examinations.

American College Test (ACT). Applicants who meet the age requirement for admission to the University may use the American College Test in lieu of the General Educational Development Tests to:

1. Validate credit earned in an unrecognized high school.
2. Meet the requirement of high school graduation.
3. Establish high school rank in class.
4. Satisfy specific subject deficiencies.

The English credit allowed for the ACT satisfies the English requirement for admission. The mathematics credit allowed for the ACT does not satisfy the algebra-geometry requirement for admission.

Subject Examinations in certain areas may be requested by a student who, lacking one or more of the high school requirements, feels he has sufficient knowledge to pass the prescribed examination. He should initiate his request in the Office of Admissions and Records.

Admission by Special Action. A student who is deficient in one or more of the admission requirements may be admitted, with the approval of the Director of Admissions and Records and the dean of the college he wishes to enter, provided he submits evidence that clearly establishes his ability to do satisfactory work in the curriculum in which he wishes to enroll.

The 45-Hour Rule. The admission requirements covering high school graduation and specific high school subjects (*except* when those subjects are prerequisites for courses required for a degree at Chicago Circle) may be waived for those students in the two categories below who have completed 45 or more quarter hours of advanced standing and have maintained at least a 3.250 average in all work attempted. See *A Transfer-Student Application, Exception* for Illinois residents.

1. Transfers to the University from fully accredited junior and/or senior colleges.

2. Transfers from one college to another within the University of Illinois.

All other requirements established for the admission of a transfer student to the curriculum of his choice must be met. Some curricula require a minimum scholastic average higher than 3.250. See *Requirements for Admission to Undergraduate Study*.

Admission to the Summer Quarter Only

Because of the demand from Chicago-area residents for nondegree programs during the summer, admission may be granted for that quarter only. The requirements are:

1. For a Beginning Freshman: graduation from high school.
2. For a Transfer Student (including those on probation): eligibility to return to his former institution.
3. For a Readmission Applicant (including those on probation): good standing on the last campus attended at the University of Illinois.

Students in categories 2 and 3 above who are not in good standing should obtain a list of full requirements from the Office of Admissions and Records.

Summer-quarter-only students are *not* admitted to the several academic colleges at Chicago Circle and do not submit regular admission applications; they must procure from the Office of Admissions and Records the special application form "Summer Quarter Only." Requests for this form may be made on and after March 1.

Applications for admission to the summer quarter 1971 and all subsequent quarters must be accompanied by the nonrefundable application fee of \$15.

Continuation for an ensuing fall quarter as a degree candidate at Chicago Circle requires submission of the regular application blank and all necessary supporting documents, and fulfillment of the admission requirements for the desired curriculum.

Rolling Admissions Program

Chicago Circle operates on a "rolling admissions" program, under which an applicant who submits his application and required records early in the period set aside for processing applications for admission to a specific fall quarter will receive notification of his eligibility within a correspondingly early period.

High School Seniors who wish to enter the fall quarter are encouraged to submit their applications for admission at the earliest possible date in the senior year. See *Admission Procedures*. By so doing, the prospective Chicago Circle freshman will have an opportunity to participate in advance enrollment during the spring and summer months prior to fall enrollment. The deadline for submission of completed* applications is September 1 or until capacity is reached, whichever occurs first, and action is taken on individual applications in the order in which they are completed.

(*Note:* Beginning-freshman applicants whose completed applications were on file on and before November 30, 1970 were notified on or about December 18 of that year as to their admissibility for the fall quarter 1971.)

*A completed beginning-freshman application is one for which all official high school transcripts and test scores are on file in the Office of Admissions and Records.

Because capacities have been rapidly increased, the enrollment of beginning freshmen at Chicago Circle has risen steadily and no reduction is anticipated in the immediate future. However, if it is necessary to limit admission approvals for any given quarter, the Program of Progressive Admission will be activated. Under this program, admission priority is given to those students who demonstrate high scholastic ability. A combination of test score and rank in class forms the selection index for beginning freshmen.

Transfer-Student Applicants and Former-Student Applicants whose applications and all supporting credentials are on file well in advance of the quarter for which admission is sought will benefit by receiving earlier notification of admissibility, under the Rolling Admissions Program. See *Admission Procedures*.

If it becomes necessary to limit admission at either the lower division (under 90 quarter or 60 semester hours) or upper division (90-and-above quarter hours or 60-and-above semester hours), admission priority will be granted in the order of scholastic excellence, in accordance with the Program for Progressive Admission, to as many applicants as capacities allow. For new transfer students and former University of Illinois students seeking readmission, the cumulative average for all previous collegiate work is the index.

Admission with Advanced Standing

Advanced standing consists of college-level credit acceptable to the University. The application of such credit toward a degree, however, is at the discretion of the dean of the college offering the degree.

Credit From Other Institutions

Fully Accredited Institutions. Work successfully completed in other fully accredited institutions (either those approved by one of the regional accrediting associations or those approved by one of the agencies recognized by the National Commission on Accrediting) is generally accepted by the University on an hour-for-hour basis, as shown on the official transcripts received from those institutions. For consistency, credit in semester hours is converted to credit in quarter hours. See *Quarter Hours*.

Provisionally Accredited Institutions. Work completed in a provisionally accredited institution is accepted only on a *deferred* basis. To receive such transfer credit, a student must earn at least a 3.000 (C) average (or higher if prescribed by the curriculum the applicant wishes to enter) within the first 18 to 45 quarter hours of work in residence at the University of Illinois or in another fully accredited collegiate institution. If the student fails to validate his transferred credit within the validation period, he then must pass proficiency examinations if he is to receive credit for his work at the provisionally accredited institution.

Unaccredited Institutions. Credit from unaccredited institutions is not accepted. However, credit in courses taken in such institutions may be established by proficiency examinations. See *Proficiency Examinations for Enrolled Students*.

Junior College Credit. Admission of transfer students to the University of Illinois is based *only* on transfer work, the nature of which has prepared students to continue on in baccalaureate-degree programs. Junior college students should check with their junior college counselors to determine those two-year-college courses that have been designated baccalaureate-oriented.

After a student attains junior standing (90 quarter hours) he must earn at least 90 of the remaining required hours in a four-year accredited institution; however, 45 of the remaining 90 hours must be taken at Chicago Circle to satisfy the residence requirement for graduation. See *Requirements for Graduation*. When a University of Illinois school or college requires three years of preprofessional college credit for admission, at least the last 45 quarter hours of preprofessional credit must be taken in an accredited four-year collegiate institution.

Credit for Military Service

Completion of not less than six months of extended active duty in any branch of the armed forces of the United States entitles an applicant to six quarter hours of credit in physical education and six quarter hours in basic military science if the applicant has been honorably separated.

Credit is also allowed for those United States Armed Forces Institute (USAFI) courses for which the American Council on Education recommends credit at the baccalaureate level, provided the student has passed the appropriate USAFI end-of-course test or examination.

Credit for service schools successfully completed and for other courses taken while the student was in service may be allowed after evaluation by the Office of Admissions and Records.

No credit is allowed for the college-level General Educational Development Tests.

Credit Through the Advanced Placement Program

This program, administered by the College Entrance Examination Board, is designed for those high school students about to enter college who wish to demonstrate their readiness for courses more advanced than those ordinarily studied during the freshman year. College credit is awarded to those students who earn sufficiently high grades on the examinations covering basic freshman-course subject matter. Many high schools offer advanced classes in one or more of the following subjects: English, French, German, Latin, Spanish, American history, European history, biology, chemistry, mathematics, and physics. The University encourages able high school students to enroll in these courses and to write the examinations in each of the foregoing subjects. The examinations are prepared by joint national committees of high school and college teachers and are administered by the Educational Testing Service. The examinations, graded by other national committees, have the following values: 5—high honors, 4—honors, 3—creditable, 2—pass, 1—fail.

Note: Transfer students may be granted credit on the basis of Advanced Placement Examinations *only* by having official copies of grades in those examinations submitted to the Office of Admissions and Records. Awarding of credit will be determined in accordance with the policies in effect at the time the official grades are received.

The University of Illinois at Chicago Circle makes these specific credit recommendations:

Humanities

English

1. Grades of 5 and 4: 12 quarter hours of credit in English 101, 102, 103.
2. Grade of 3: Referred to the department.
3. Grade of 2: No credit.

French

1. Grades of 5, 4 and 3: 8 quarter hours of credit at the lower-division level.
2. Grade of 2: Referred to the department.

German

1. Grades of 5, 4, and 3: 8 quarter hours of credit at the lower-division level.
2. Grade of 2: Referred to the department.

Latin 4

1. Grades of 5, 4, and 3: 4 quarter hours of credit at the lower-division level.
2. Grade of 2: Referred to the department.

Latin 5

1. Grades of 5, 4, and 3: 8 quarter hours of credit at the lower-division level.
2. Grade of 2: Referred to the department.

Spanish

1. Grades of 5, 4: 8 quarter hours of credit at the lower-division level.
2. Grades of 3 and 2: Referred to the department.

Note: French, German, Latin, and Spanish papers do not carry automatic credit in a particular foreign language course. Hence, the student, in consultation with the appropriate department may select the course for which he is best qualified. When such selection has been determined, credit, up to a maximum of 8 hours, will be granted in courses preparatory for that in which the student has been placed.

Social Studies*American History*

1. Grades of 5 and 4: Credit for History 151, 152, 153. (12 quarter hours)
2. Grades of 3 and 2: No credit.

European History

1. Grades of 5 and 4: Credit for History 111, 112, 113. (12 quarter hours)
2. Grades of 3 and 2: No credit.

Natural Sciences and Mathematics*Biology*

1. Grades of 5, 4, and 3: Credit for Biological Sciences 100, 101, 102. (12 quarter hours)
2. Grade of 2: No credit.

Chemistry

1. Grades of 5 and 4: Credit for three quarters of general chemistry (12 quarter hours) and permission to enroll in Chemistry 121.
2. Grade of 3: Credit for two quarters of general chemistry (8 quarter hours) and permission to enroll in Chemistry 114. Each student may take a proficiency examination in Chemistry 114 immediately after

enrolling. If he passes, he is given credit in that course also and is permitted to register in the next chemistry course in sequence.

Mathematics

1. Grade of 5 on the AB or BC examination: Credit in Mathematics 130, 131, 132, 133 (20 quarter hours) and advanced placement in any course for which Mathematics 133 is a prerequisite.
2. Grade of 4 on the AB or BC examination: Credit in Mathematics 130, 131, 132 (15 quarter hours) and advanced placement in Mathematics 133.
3. Grade of 3 on the AB or BC examination: Credit in Mathematics 130, 131 (10 quarter hours) and advanced placement in Mathematics 132.
4. Grade of 2 on BC examination: Credit in Mathematics 130 (5 quarter hours) and advanced placement in Mathematics 131.
5. Grade of 2 on the AB examination: Students in this category are invited to take a proficiency examination in Mathematics 130. Passing of this examination will give 5 quarter hours of credit in Mathematics 130 and advanced placement in Mathematics 131.

Physics

1. Grades of 5 and 4: Credit in Physics 111 (4 quarter hours) or Physics 101 (5 quarter hours), depending on the student's curriculum.
2. Grade of 3: Automatic admission to a proficiency examination that covers Physics 111, 112, 113, and 114 or Physics 101, 102, and 103, depending on the student's curriculum. Grades of A or B on the proficiency examination on the first sequence carry 19 quarter hours of credit; on the second sequence, 15 quarter hours of credit. Grades of C: Consult the Department of Physics.
3. Grade of 2: With the approval of the Department of Physics, students may write a proficiency examination in any one of the courses in the sequences listed in paragraph 2. Credit will be allowed only for those courses in which the student has proficiency examination grades of C or higher.

Credit Earned Through the American College Test

Students whose American College Test subscore in English is 27 or higher will be given 4 hours of credit in Rhetoric 101. Those whose American College Test subscore in English is 25 or 26 may register for the honors sequence in Rhetoric 101 and 102. No comparable provisions exist for the other subscores on the ACT.

Credit Earned Through the Talented Student Program

Such credit is entered on the student's permanent University record. If he is admitted as a regular student after high school graduation, he is given advanced placement in those subjects in which he earned credit. See *Talented Student Program for Illinois High School Seniors*.

Admission Procedures

Application Fee. All applicants for admission pay a nonrefundable application fee of \$15 to be enclosed with the application sent directly to the Office of Business Affairs in the official envelope provided with the application blank. Applications mailed directly to the Admissions Office and applications not including the fee will be returned *to the applicant*. The Office of Business Affairs retains only the nonrefundable fee and forwards the application and all official transcripts and other records to the Office of Admissions and Records.

An undergraduate applicant falls into one of three major admission categories: beginning freshman, transfer student, or readmission applicant. The specific steps to be completed by the applicants in each category follow. Application blanks may be obtained by mail, telephone, or in person from the Office of Admissions and Records, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

Preadmission Counseling. Admissions and Records also maintains a preadmission counseling service, which is available to all prospective students. An appointment is not required, and inquiries are welcome during the normal working day, Monday through Friday. Members of this section also visit high schools and junior colleges in the Chicago area to explain fully the admission requirements and procedures. They will also, on request, arrange for high school students and counselors to come to the campus for group discussions and tours.

Beginning-Freshman Applicants. High school seniors who wish to enter a fall quarter are encouraged to submit their applications for admission as early as possible after September 25 of their senior year. See *Application Deadlines*. The completed application and a check or money order for \$15 made out to the University of Illinois should be submitted to the high school principal with the request that they be mailed in the appropriate envelope to the Office of Business Affairs *together with* an official transcript of the high school, which should include:

For the student in the seventh semester (first semester of the senior year): grades for the first three years, rank in class at the end of the sixth semester, courses in progress during the seventh semester, and courses planned for the eighth semester (or a statement that those in the seventh will continue through the eighth semester), and the probable date of graduation.

For the student in the final semester of his senior year: grades for the first seven semesters, rank in class at the end of the seventh semester, courses in progress, and the probable date of graduation.

A student who has been graduated from high school but has not completed a sufficient number of college credit hours to be classified as a

transfer student¹ should submit the complete application and a check or money order for \$15, made out to the University of Illinois, to his high school principal with a request that they be mailed directly to the Office of Admissions and Records *together with* a final transcript of his high school record and a statement of his scholastic rank when he was graduated.

Beginning-Freshman applicants who wish to enter a quarter other than the fall quarter must follow the foregoing procedures.

Application Deadlines for Beginning-Freshman Applicants

<i>Quarter</i>	<i>Applications Accepted on and after:</i>	<i>Recommended Deadline²</i>
Fall	September 25 of previous year	August 1
Winter	October 1	December 1
Spring	December 1	March 1
Summer*	March 1	June 1

*See *Admission to the Summer Quarter Only*.

Students in all the foregoing categories must have their official scores on the tests administered by the American College Testing Program (ACT) sent to the Office of Admissions and Records. Information about where and when to take the ACT may be obtained from the high school counselor or by writing the ACT Registration, P.O. Box 414, Iowa City, Iowa 52240. If the applicant has completed this test but did not request that the scores be sent to the Office of Admissions and Records at Chicago Circle, he should send \$2 (two dollars) to the Records Department, American College Testing Program, P.O. Box 451, Iowa City, Iowa 52240, together with a request that a copy of the scores be mailed to the Office of Admissions and Records. An applicant who has not taken the ACT but has taken the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board should have his official scores submitted to the same office; he will be considered for admission on the basis of those scores. If either the ACT or the SAT is taken more than once, the highest score reported is used to determine the scholastic index.

The University of Illinois urges prospective entering freshmen to take one or the other of the tests in the latter part of the junior year in high school or as soon thereafter as possible.

¹An applicant, who, as defined above, is a beginning freshman but has completed some college work must have a final transcript of that work forwarded to the Office of Admissions and Records. If he is currently enrolled at an accredited college or university at the time his application is submitted, he must request the institution he is attending to send to the Office of Admissions and Records a transcript indicating his courses in progress.

²Date by which application and all required records should have been received to permit consideration for the term indicated. Admission consideration will cease if capacities are reached prior to the recommended deadline.

Transfer Applicants. If a transfer applicant (see *Transfer-Student Applicant*) is not presently enrolled in college, he should mail his application in the appropriate envelope addressed to the Office of Business Affairs. At the same time, he should request his high school principal and the registrar of each collegiate institution he has attended to send official transcripts to the Office of Admissions and Records. See *Rolling Admissions Program*.

If the applicant is enrolled in college at the time he submits an application, he should comply with the directions above and, during the last term in which he is enrolled in his current college, request that the transcript from that institution include a list of the courses he is taking. His cumulative grade-point average may make it necessary to delay final decision on his application until he has completed work at the institution from which he plans to transfer.

Application Deadlines for Transfer and Readmission Applicants

<i>Quarter</i>	<i>Applications accepted on and after:</i>	<i>Recommended Deadline*</i>
Fall	February 1	August 1
Winter	October 1	December 1
Spring	December 1	March 1
Summer†	March 1	June 1

†See *Admission to the Summer Quarter Only*.

Readmission Applicants. If an applicant has previously attended one or more campuses of the University of Illinois, he must indicate on his application the campus or campuses on which he was registered: Chicago Circle (including its predecessor at Navy Pier), the Medical Center at Chicago, or the Urbana-Champaign campus. If his last University attendance was at either Navy Pier or Chicago Circle, he submits only those transcripts for work completed since the University of Illinois attendance. However, a student who wishes to transfer to Chicago Circle from the other campuses is subject to the same procedures required of applicants for transfer from other collegiate institutions. See *Transfer-Student Applicant*.

Students who request transfer from one campus to another or request readmission to the campus previously attended are subject to the same application-fee and advance-deposit regulations and to the same procedures that apply to other applicants.

Note: A student whose *only* previous registration at the University of Illinois was in correspondence or extramural courses or as a nondegree candidate summer-quarter-only registrant must present complete records of all scholastic work, both high school and collegiate, as outlined above for new students, and must meet the admission requirements of his chosen college and curriculum if he is to be considered for admission.

*Date by which applicant and all required records should have been received to permit consideration for the term indicated. Admission consideration will cease if capacities are reached prior to the recommended deadline.

Foreign-Student Applicants. Applicants from outside the United States of America should request from the Office of Admissions and Records an Application for Admission for Applicants in Other Countries. The application, original or certified copies of education credentials, and a check or money order for \$15 (nonrefundable application fee) should be sent to the Office of Business Affairs in the special envelope provided.

All credentials for foreign-student applicants must include all secondary and post-secondary level studies completed to date, grades or examination results received (both failing and passing), maximum and minimum grades obtainable, rank in class, degrees, diplomas, certificates earned, and length of the school year. Original documents in languages other than English must be accompanied by official English translations.

Applicants whose native language is not English will be required to take an English proficiency test, even though the foreign instruction was in English. The proficiency test prescribed is the Test of English as a Foreign Language (TOEFL), and arrangements usually can be made to take it in the country in which the applicant lives. If that is not possible, arrangements may be made by writing to the Educational Testing Service (ETS), Box 899, Princeton, New Jersey 08540. TOEFL is not required for students from *countries* where English is the native language.

If the foreign applicant is admissible, his performance on the English test will either (1) excuse him from further study of English, or (2) indicate the need for additional study of English. In the latter event, he is required to take a placement test administered by the Coordinator for Foreign Student Affairs prior to his registration. The results of the Placement Test determine whether or not the student is required to register for one or more zero credit courses in English. If so, his program of credit courses is reduced accordingly, and a longer time may be necessary for completion of his degree requirements.

Selection of College and Curriculum

A beginning-freshman applicant who is in doubt about the courses of study he should pursue may secure help in reaching a decision by attending the guidance program of the University. The Student Counseling Service offers Freshman Guidance Examinations to second-semester high school seniors and to high school graduates. Applicants are strongly urged to take these examinations; information will be sent to all beginning-freshman applicants by the Office of Admissions and Records. If he completes the examinations and submits his ACT scores, the applicant will receive an appointment from the Student Counseling Service, which offers professional counseling. However, completion of the Freshman Guidance Examination has no bearing on an applicant's eligibility for admission.

Applicants should not delay submission of the application until after the consultation with the Student Counseling Service; if, as a result of counseling, the applicant wishes to change the college and curriculum he had previously designated, he may make written request to the Office of Admissions and Records.

Additional Records

If, in individual cases, records in addition to those listed for prospective beginning-freshman, transfer, and readmission applicants are needed, the applicant will be notified by the Office of Admissions and Records. Such records may include a recommendation from a college dean, an Illinois residence clarification, name clarification, approval for admission to specific programs, or other documents.

An applicant who has served on active duty in the armed forces of the United States *must* submit a photocopy of his service-separation papers.

Tuition-and-Fee Deposit

When the notice of eligibility for admission or readmission is mailed to an applicant, it is accompanied by a request for payment of a *nonrefundable* tuition-and-fee deposit of \$30 which is applied toward his first tuition assessment. The request for payment carries a deadline by which the deposit must be sent. Failure to make payment by the specified deadline will be construed as meaning the student no longer wishes to be considered for admission to that quarter.

Exception: The deposit is not required if an applicant indicates on his deposit card that he intends to register for less than 12 hours or that he is a member of the nonacademic staff of the University of Illinois.

Permit to Enter

After he pays his tuition-and-fee deposit, a student is sent either a Permit to Enter or a Notice of Readmission, as appropriate. These documents are statements of confirmation of reserved space in the college and curriculum he desires and a description of any advanced standing allowed him on admission or readmission. Also enclosed are the instructions he must follow to complete his registration.

Registration Procedures

Registration is the act of enrolling in an approved program of courses after a new student has been granted a Permit to Enter. Registration includes:

1. Course placement tests. (Not required of readmitted students.)
2. A medical examination. (Not required of readmitted students.)
3. Program advisement and approval.
4. Payment of tuition and fees indicated on fee assessment cards issued by the Office of Admissions and Records.

Until the student has completed *all* of the foregoing procedures (where applicable), he is not fully registered in the quarter to which he has been admitted.

A Program consists of the courses and sections in which a student is currently registered.

Off-Quarter Vacations. A student may elect to attend any three quarters in one calendar year. If he chooses to use a quarter *other than the summer* as his vacation, or Off Quarter, he must file an application with the Office of Admissions and Records before the first day of instruction of the quarter he wishes to use as vacation. Application blanks for the purpose are available in that office. If the vacation quarter is other than the summer quarter, the student must attend the summer quarter of that calendar year if he wishes to retain his status as a continuing student.

The Medical Examination

All new students are required to take a medical examination prescribed by the University Health Service. This examination must be administered by the student's own physician at the student's expense. Instructions and the required forms are mailed by the University after admission approval.

After the medical examination is completed and the forms are returned to the Health Service, the student will be sent a receipt, which he must bring to his advisement and registration conference.

The Placement Tests

Required of most students registering for the first time in the University of Illinois, these tests determine course placement and are not taken until after an applicant receives his Permit to Enter. Instructions about the tests are clearly stated in the material enclosed with the permit. A new student must ascertain from these instructions whether he must take the placement tests in foreign language, mathematics, and chemistry, since all tests are not required of all students.

Academic Advising and Program-Request Conference

All new and former students who have been granted admission or readmission to a fall quarter are scheduled for conferences at which they are advised by representatives of the several college offices. Subsequently, students are assigned to program-request conferences, during which they make final course and section selection and pay the balance due on tuition and fees.

Residual Registration is conducted for each quarter in the week prior to the beginning of instruction.

Fall quarter—for students admitted too late to be scheduled for the summer conferences noted above.

Winter, spring, and summer quarters—for all students granted admission or readmission to those quarters.

During residual registration a student meets with an adviser from the college to which he has been admitted. Together, they plan the student's program for the ensuing quarter.

Tuition and Fees

Tuition and some fees are assessed all students and are payable in full as part of registration. Under certain circumstances arrangements may be made with the Business Office to defer payment. The amount of the tuition and the service fee varies with the number of credit hours for which the student registers, and subsequent change in the number of hours carried could result in a change in those amounts. Tuition (but not the service fee) also varies according to the Illinois resident or nonresident status of the student.

In planning to meet financial requirements for the 1971-1972 school year, the student should be aware that tuition rates at State universities will not be finally known until their budgets are approved for that period by the General Assembly in the spring of 1971. The Board of Higher Education has undertaken a study of tuition charges and financial-aid programs and is expected to make recommendations to the Governor and the General Assembly for consideration in the budgetary deliberations during the next legislative session.

Tuition and Fees—Chicago Circle (Subject to Change)

	Range I 10½ quarter hours and above		Range II 5½ through 10 quarter hours		Range III 0 through 5 quarter hours		Range IV 0 credit only Resident and Nonresident
	Res.	Nonres. ¹	Res.	Nonres. ¹	Res.	Nonres. ¹	
² Tuition (except those holding exemptions)	\$132	\$418	\$ 92	\$287	\$ 50	\$157	\$25
³ Service Fee	32	32	24	24	14	14	7
Hospital-Medical- Surgical Insurance Fee	<u>107</u>	<u>107</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>
Total	\$171	\$457	\$123	\$318	\$ 71	\$178	\$178

¹See Residence Classification.

²Effective January 1, 1971

³The Service Fee is used to cover the operating expense of Chicago Circle Center, the Financing of the Center building, and the cost of the Student Activities Program.

Tuition for Zero-Credit Courses. Students taking one or more courses for zero credit, but no courses for credit, will be assessed for tuition and fees as follows:

- a. *For study on-campus:* One-half of the Range III resident tuition and one-half of the Range III service fee, each rounded to the next higher even dollar, and the full hospital-medical-surgical fee. (No charge will be assessed, however, for University employees who register, at the request of their department, only in zero-credit courses especially established to improve the work of the employee.)
- b. *For study off-campus,* including graduate registration in absentia: One-half of the Range III resident tuition, rounded to the next higher even dollar, but no service fee and no hospital-medical-surgical fee.

Students simultaneously taking one or more courses for zero credit and one or more courses for credit will be assessed for tuition and fees on the basis of the credit course (s) only.

The Hospital-Medical-Surgical Insurance Fee

This fee is the same for all students, regardless of the number of hours for which they are enrolled or of their Illinois residence status. However, if a student presents evidence of insurance in force that provides him equivalent coverage, he may petition the University Insurance Office for a refund of his fee. Refunds are not made on any other basis. The student also must consult the Insurance Office about the time limit for such a refund petition. If a student withdraws from the University, he does not receive a refund, since he remains insured for the balance of the quarter from which he withdrew. See *Hospital-Medical-Surgical Insurance*.

Additional Fees and Charges

One or more of the following additional fees and/or charges will be assessed as applicable.

The Course-Visitor Fee of \$15 is assessed all class visitors who are not in Range I in the tuition-and-fee schedule. See *Visitors*.

The Special-Examination Fee of \$10 is assessed for a special examination taken in the hope of obtaining credit in a course that has been failed at the University of Illinois. See *Student Handbook* (University of Illinois at Chicago Circle).

The Transcript Fee of \$1 is assessed for each additional transcript sent after the first, which is issued without charge.

The Late-Registration Fine of \$15 is levied against all students who complete registration after classes have begun.

The Lost-Photo-Identification-Card Fee of \$1 is assessed for replacing a lost or destroyed Photo-Identification Card, issued to the student at the time of his first registration at Chicago Circle. The cost for replacing the student Fee Receipt Card alone is \$.50.

The Deferred-Fee Charge of \$2 is made when arrangements have been made with the Business Office to defer payment of fees. This charge, which is nonrefundable, must be paid on the day the agreement is reached.

Refunds

Students who withdraw from the University or from a course are, under certain circumstances, entitled to a refund of a portion of the tuition and fees paid. All requests for withdrawals should be initiated in the office of the college in which the student is enrolled.

Refunds on Withdrawal from the University. The student who withdraws *within the first ten days of instruction* is entitled to a refund of the full amount of tuition and fees, *except for the \$31 nonrefundable charge*. After the tenth day of instruction and before the middle of the quarter, one half of the amount assessed is refunded, *except for the nonrefundable charge*. The calendar in the quarterly Timetables indicates the dates on which the above regulations are effective.

No refund is issued after midquarter.

No refund is issued if the total assessment was less than \$31 (for example, a student on a tuition-waiver scholarship).

Refund on Withdrawal from a Course. If withdrawal from a course results in a reduction in the student's program to a lower tuition-and-fee range, the full difference is refunded during the full-rebate period; half the amount of the difference is refunded when withdrawal occurs during the half-rebate period; no refund is made if withdrawal occurs thereafter.

Refund on Withdrawal by a Visitor. A full refund will be issued if the withdrawal is made *within ten days after payment of the fee*. Thereafter, no refund will be made.

Refund on Withdrawal to Enter Military Service. When a student withdraws from the University to enter military service, he must be on active duty within ten days after withdrawal if he is to benefit from the rules stated below; *it is his responsibility* to present proof of his active-duty status. The most effective way of presenting such proof is to have the personnel officer of the unit to which he is assigned certify to the University the date of the student's assignment to active duty.

If withdrawal occurs during the first five weeks of instruction, the student is entitled to a full refund of his tuition and fees, less the Hospital-Medical-Surgical Insurance fee.

If withdrawal occurs during the sixth to eighth week (inclusive) of instruction, the student will receive one half refund of his tuition and fees, less the Hospital-Medical-Surgical Insurance fee.

No refund of tuition and fees is made after the eighth week, but full credit is allowed for all courses in which the student has a grade of C or higher and a W, withdrawn without penalty, is recorded for courses in which his grade is below C.

For additional credit information for the student who enters military service, see *Transfer and Withdrawal*.

Transcripts

Each student who has paid all his University fees is entitled to one transcript free of charge. (See *Transcript Fee*.) However, students who are in debt to the University are not entitled to register for ensuing quarters nor to receive official transcripts or diplomas until the indebtedness is cleared.

Transcripts of official records are issued only on the request of the student. The Office of Admissions and Records will honor a student's written request to have information other than that which is considered public (i.e. name, date of attendance, curriculum, and degrees and honors earned) released or withheld. The Director of Admissions and Records may, at his discretion, release academic information in order to obtain financial assistance or honors recognition for the student.

Student Affairs

Oscar Miller, M.A., Dean of Student Affairs
Weyman L. Edwards, M.Sc., Assistant Dean of Student Affairs
Warren O. Brown, B.S., Dean of Men
Ronald A. Brown, B.A., Assistant Dean
Agnes G. Tandberg, M.A., Dean of Women
Barbara C. Roy, M.Ed., Assistant Dean
Arthur J. Falls, B.S., Director of Financial Aid
Phillip G. Baugher, B.A., Coordinator of Student Employment
Susan M. Rocco, B.A., Assistant Coordinator of Student Employment
Constance M. Wilson, M.A., Coordinator of Loans
Mariko N. Gallaga, B.A., Coordinator of Scholarships and Grants
Laurette A. Kirstein, M.S., Coordinator of Foreign Student Affairs
Kenneth W. Phifer, D.M., Assistant Coordinator of Foreign Student Affairs
John E. Kysar, M.D., Director of Health Services
Daniel J. McCarthy, M.D., Assistant Medical Director
Ronald Q. Swaim, Ed.D., Coordinator of Placement Services
Richard G. Bickhaus, Ed.Sp., Assistant Coordinator of Placement Services
Harold Klehr, Ph.D., Director of Student Counseling
Harold F. Rodman, M.Ed., Director of the Office of Organizations and Activities
Susan S. Erskine, M.A., Assistant Director of the Office of Organizations and Activities
Barry E. Simon, B.S., Assistant to the Director of the Office of Organizations and Activities

The academic life of the student is supervised by the dean of the college in which the student enrolls; however, the University's interest in the individual extends beyond the classroom to include his personal welfare and his orientation to college life.

The Dean of Student Affairs

The Dean of Student Affairs is a major officer of the University. He reports directly to the Chancellor and helps in the formulation of policy that governs student affairs; he also works closely with other members of the administrative staff, with Student Government and other student organizations, and with the faculty Senate Committee on Student Affairs. His office is responsible for coordinating the activities and functions performed by the Offices of the Dean of Men, the Dean of Women, Financial Aid, Student Employment, Foreign Student Affairs, Organizations and Activities, Placement, Student Counseling, and the University Health Service. The Office of the Dean of Student Affairs, along with the offices listed above, should be regarded as the principal point of contact between the individual student, the student organizations, and the University Administration. Problems faced by students in their adjustment to the University, including their relationships to each other, to extracurricular activities, to their college offices, to the University police, or to other administrative agencies may be brought to this or to any of the above offices for help in their resolution.

Academic and Other Regulations

Each incoming student receives a copy of the *Student Handbook*, which provides information about the University. The student has a personal obligation to familiarize himself with its contents and with the customs and policies of this campus. Enrolled students may obtain copies from the Information Desk in the Lobby of University Hall or from the Office of Student Affairs.

The Dean of Men and the Dean of Women

These officers and their staffs are available daily for conferences with students or with their parents. The Dean of Men and the Dean of Women, from their offices on the eighth floor of University Hall, also work closely with various student activities and organizations.

The Student Counseling Service

By providing personal counseling, specialized group services, and psychological testing, the Student Counseling Service aims to foster the educational, vocational, and personal development of the student so that he may attain maximum benefits from his educational experiences. It is the privilege of the student to make use of the following services whenever the need arises.

Educational, Vocational, and Personal Counseling are available to any student who may be uncertain about his choice of college or major or who needs help in choosing an occupation or who is concerned with personal problems.

Group Services are provided for the student who wishes to improve his reading comprehension and speed, who wants to establish better study methods, who needs help in planning a career, or who wishes to develop his interpersonal skills.

Freshman Guidance Examinations, followed by a counseling appointment, are offered to all graduating high school seniors who have completed the American College Test (ACT) or the Scholastic Aptitude Test (SAT), one of which is required of applicants for admission to the University. This service, which is provided to Illinois residents, has no bearing on the applicant's eligibility for admission.

Pre-Entry Counseling is offered to the graduating high school senior or to the transfer student to help him determine the college and the curriculum of the University that best meet his needs, to formulate his educational and vocational goals, and to clarify his thinking on how to make a good start in his college work.

Individual and Group Tests are offered to registered students in support of educational, vocational, and personal counseling. In addition, the student interested in taking various national examinations for admission to graduate and professional colleges may wish to consult with the Student Counseling Service.

The Speech and Hearing Clinic, under the auspices of the Student Counseling Service, provides, free of charge, facilities for hearing testing, diagnostic speech and voice evaluations, and correction of speech problems. Students who wish assistance in correcting speech difficulties, including those arising from foreign accents, hearing impairments, and voice or articulation problems should avail themselves of the services of this clinic, located in 202 Grant Hall.

The University Health Service

Better physical and mental health for the students at Chicago Circle is the goal of Health Service doctors, who are experienced clinicians and most of whom have practiced for years as family physicians or as specialists.

Medical examinations are required of all students before their first registration. The examination is made by the family physician at the student's expense.

Beds for the temporary day care of ill students are provided. The University does not provide hospital care for its students, the large majority of whom are from families living in the Chicago area; hence, cases requiring bed care are referred to the student's family doctor and to hospitals of the community.

The University provides clinic services for both preventive medicine and treatment. The cost of most medical expenses that cannot be assumed by the Health Service is covered by the student Hospital-Medical-Surgical Insurance, supervised by the Insurance Division of the Business Office, at a cost to the student of \$7 per quarter.

Financial Aid

Scholarships of various types, grants, loans, and employment are the main areas of financial aid for undergraduates. Loans and employment are also available to graduate students. For additional information, see *Graduate Study*. A student will receive an application for financial aid when he receives his application for admission to the University. Applications for financial aid for continuing students are available at the Office of Financial Aid.

Illinois State Grants

Under legislation passed by the General Assembly, the Illinois State Scholarship Commission administers a greatly expanded program of grants to pay the cost of tuition and fees at all approved colleges and universities in the state.

A student who was not awarded an Illinois State scholarship, either honorary or monetary, may apply for a grant. Applicants entering college for the first time should apply through the high school counselor; prospective transfer students and junior college graduates secure forms from the financial aid office of the school they are currently attending in Illinois or through the University of Illinois at Chicago Circle Office of Financial Aid.

Continuing students at the University of Illinois at Chicago Circle may secure Illinois State Grant application forms from the Financial Aid Office, Eighth Floor, University Hall, after December 1.

Students enrolled at Chicago Circle are reminded that if they wish to be considered for all types of funds available under financial aid, two separate and distinct financial statements must be filed; The University requires that a Family Financial Statement be sent to the American College Testing Program, Iowa City, Iowa, or, alternately, that a Parents' Confidential Statement be sent to the College Scholarship Service, Box 881, Evanston, Illinois; the Illinois State Scholarship Commission requires its own financial statement in addition to the foregoing. Forms are not interchangeable, although the same information is requested on both. The deadline for applications is February 15 for the following academic year (September through June).

Educational Opportunity Grants

The University of Illinois at Chicago Circle, in cooperation with the federal government, is administering the Educational Opportunity Grants authorized under the Higher Education Act of 1965.

The basic purpose of the Educational Opportunity Grant Program is to assist students who have exceptional financial need, and who, for lack of financial means of their own or of their family, would not be able to enter or remain in college without such a grant.

An Educational Opportunity Grant may be awarded to the student who meets the following basic eligibility criteria:

1. He must be a citizen of the United States or must be in the United States permanently and must intend to become a citizen.
2. He must show evidence of academic or creative promise and must be capable of making satisfactory progress.
3. He must be accepted for enrollment or be enrolled in a full-time undergraduate course of study and must continue to be a full-time student while receiving the grant. Twelve hours per quarter is considered full time.
4. He must be willing to accept an equal amount of financial aid, which will serve as the matching portion of the grant.
5. His family's income should not exceed \$6,000 gross per year.

Applications for Educational Opportunity Grants should be made early in the senior year of high school. A student will receive an application for financial aid with his Application for Admission to the University. The grants will be awarded during the spring or summer to high school seniors who have been admitted for freshman registration for the fall quarter, as well as to currently enrolled students who will be returning to college in September, provided they have not completed more than seven (7) semesters or eleven (11) quarters (or the equivalent) of college-level work. Continuing students are also eligible for these grants. Applications may be obtained from the Office of Financial Aid.

A student's eligibility and grant stipends are determined by the expected contributions from the income and assets of his parents. Therefore, it is *required* that all students who wish to be considered for an Educational Opportunity Grant submit a Family Financial Statement or a Parents' Confidential Statement. These forms may be obtained from high school counselors or from the Office of Financial Aid.

The matching portion of the grant can be provided from one or more of the following sources: University scholarships and grants, tuition waivers, approved loans and employment programs; State scholarships or grants; scholarships or grants offered by corporations or service organizations (such as Rotary, Elks, P.T.A.). It is understood that the University of Illinois will approve and/or award all matching aid.

Educational Opportunity Grants range from a maximum of \$1,000 to a minimum of \$200 per academic year. An Educational Opportunity Grant can be renewed for the normal four-year period the student requires to complete his undergraduate study, but in no event can the grant exceed four academic years. A student will be eligible to renew his grant as long as he is making satisfactory progress as a full-time student and demonstrates continued financial need.

Married students and students independent of parents meet additional qualifications. Consult the Financial Aid brochures for details.

Scholarships

Scholarships at the University of Illinois are limited in number and are awarded to the best qualified applicants. Each scholarship may have specific restrictions; nearly all require:

1. A superior scholastic record.
2. Evidence of financial need.

Financial need is evaluated from the completed Family Financial Statement, processed through the American College Testing Program, Iowa City, Iowa. Forms and information can be obtained from high school counselors or by writing to Iowa City. In the absence of the above statement, the University will accept the Parents' Confidential Statement, processed through the College Scholarship Service at Evanston, Illinois.

Most scholarships are awarded in late spring or early summer for the following school year. Incoming freshmen should apply for fall-quarter awards early in the senior year of high school. A student currently enrolled in the University of Illinois may file an application if his scholastic average is 3.750 or higher.

University Scholarships. Most University of Illinois scholarships are restricted to Illinois residents, since the University is a state-supported institution. However, the University does have some scholarship funds for out-of-state students.

A few scholarship awards are made in cash, but for the most part scholarships exempt the recipient from the payment of tuition and, in certain cases, fees. Most annual scholarships are renewed if the student maintains the required scholastic average and continues to demonstrate financial need.

An entering freshman who is awarded a University scholarship must rank at least in the top quarter of his high school class and must demonstrate financial need. Past records indicate the average freshman scholarship winner ranked in the upper 10 percent of his high school class.

Junior College Scholarships are two-year tuition scholarships authorized by the Board of Trustees for Illinois junior college graduates who have a cumulative grade-point average of 3.750 or better.

Military Scholarships. Any veteran who meets University admission requirements is scholastically qualified for a Military Scholarship. The Illinois Military Scholarship may be used concurrently with a United States government grant-in-aid scholarship or an NDSL loan.

Students who are eligible for the Illinois State Military Scholarship are entitled to receive benefits from both the G.I. Bill and the scholarship. If a student's Military Scholarship has expired, however, he is *not* eligible to reapply for it. The following is a summary of the requirements for the Military Scholarship:

Residence Requirement

The applicant must have been a resident of the state at the time he entered active service or must have been a bona fide resident of the state for at least 6 months prior to entering active service and upon leaving the service must have returned to the State within 6 months and must have resided in the state for not less than one year immediately prior to the date of his application.

Length of Active Service

The applicant must have been on active duty for *not less than one year* unless he received an honorable discharge for medical reasons directly connected with such service.

Termination of Scholarship

An Illinois State Military Scholarship will automatically terminate four consecutive calendar years after the effective beginning date unless extension has been granted because of illness, the need to earn funds for schooling, or re-entry into active service.

Additional requirements are under consideration and may be imposed by the Illinois State Scholarship Commission.

Work Scholarships for Superior Students. Each year the Financial Aid Committee, under authority from the Board of Trustees, sets policy for the selection of worthy students for the Work Scholarship Program. A Work Scholarship exempts the student from payment of tuition each quarter and requires an average of ten to twelve hours of work per week, which makes it possible for him to earn money for most of his other college expenses. Information about Work Scholarships may be obtained from the Office of the Director of Financial Aid.

Loan Funds

Because the number of scholarships is limited and many worthy students are unable to qualify for those available, other forms of financial aid are also provided at the University of Illinois to assist the student in financing his college education.

Financial Statement Requirement for University Loans

Continuing demand for limited loan funds dictates that priority must be established for all National Defense and University long-term loans. In addition, *all undergraduates must file a Family Financial Statement for loan and/or scholarship or grant consideration.* Independent students (those not claimed as a tax exemption by their parents for two years prior to filing for consideration) must file a Family Financial Statement and supply a notarized statement of nonsupport from parents.

National Defense Student Loans. The National Defense Education Act of 1958 and the Higher Education Act of 1965 make available federal funds for loans to superior students. Applicants must be United States nationals. This includes citizens and all persons who are in the United States on a permanent-resident status. Borrowers are required to sign an oath of allegiance to the United States. In approving these loans, preference is given to applicants who express a desire to teach in elementary or secondary

schools and to applicants whose academic background indicates a superior capacity or a preference for science, mathematics, engineering, or a modern foreign language. All applicants must show need for financial assistance. Students currently enrolled in the University of Illinois and progressing satisfactorily toward a degree may be eligible.

Loans are limited to \$1,000 each year (July 1 to June 30), with a maximum of \$5,000. The borrower must sign a promissory note. These federal loans carry 3 percent interest beginning nine consecutive months after the borrower ceases to be a full-time student, either by graduation or by withdrawal. A postponement of payments and a suspension of interest on the note, of not more than three years, may be arranged during the time the borrower is serving in the armed forces of the United States or in the Peace Corps. Those who teach full time in public elementary or secondary schools may have as much as 50 percent of the debt cancelled at the rate of 10 percent for each year of teaching. Also, if a borrower teaches in a so-called hardship, or culturally deprived area, he may have a loan cancelled at the rate of 15 percent to a maximum of 100 percent. In case of the death or permanent disability of the borrower, the loan and interest thereon may be cancelled.

University Loans. Both long-term and short-term loans are made to the student who can demonstrate need.

Long-Term University Loans are usually available to students who have completed, with a satisfactory record, a year or more at the University. The maximum loan that an individual may have outstanding at one time is \$2,500.

Arrangements may be made to repay loans over a four-year period; payments begin four months after the student leaves school or otherwise ceases to be enrolled on a full-time basis. Security, in the form of a qualified endorser as a cosigner or evidence of collateral satisfactory to the Office of Business Affairs, is required for all long-term loans unless otherwise provided in the deed or gift of the fund or by waiver in meritorious cases.

Illinois Guaranteed Loan Program. The Illinois General Assembly has authorized an Illinois loan program to guarantee student loans made by commercial lenders.

An applicant must be a citizen, a bona fide resident of the State of Illinois, a person of integrity, and enrolled in a full-time program (12 quarter hours minimum).

An eligible student who has been accepted for enrollment in college may borrow from a minimum of \$300 to a maximum of \$1,000 for freshmen and \$1,500 for all other students, undergraduate and graduate. There is no age restriction; a minor is eligible to enter into a loan contract and to assume the responsibility for his own indebtedness. Repayment does not begin until the student either is graduated or ceases full-time study.

A list of the participating lending institutions is included with the application materials. Preferably, applicants should apply to a participating lending institution in or near his home community.

The maximum interest rate permitted by law is 7 percent simple interest, which begins on the date of the loan. If the family's annual adjusted income is less than \$15,000, the federal government pays all the interest while the student is in college and the student pays the principal and 7 percent interest during the repayment period. A student not qualified for a federal interest subsidy pays his own interest semiannually while he is in college.

Application forms and additional information about this program are available from participating lending institutions (banks, credit unions, and loan associations) in or near the student's home community or from the financial aid office of any college in the State of Illinois. Students who are out of the state at the time they wish to apply for a loan may request application materials from:

Illinois Guaranteed Loan Program
Box 33
Deerfield, Illinois 60015

Short-Term University Loans In emergencies, students may borrow up to \$100 for short periods. These funds, which are available immediately, must be used for educational expenses and are secured through the offices of the Dean of Men and the Dean of Women.

Short-term loans are repayable in forty-five days or by the end of the quarter in which the loan is received, whichever comes first. A special provision permits a graduating senior to borrow \$200 to meet expenses incurred for employment interviews.

Interest is not charged. However, there is a service charge of one dollar (\$1) assessed on each loan.

United Student Aid Funds Program. The University cooperates with banks throughout the nation to make student loans available under this program. Undergraduates may borrow up to \$1,000 a year; graduate students up to \$2,000 a year. A student may borrow a maximum of \$4,000 for his undergraduate and graduate programs.

Repayment begins five months after a borrower ceases to be a full-time student. He has a maximum of four years to repay the loan in monthly installments.

Applications for these loans are initiated and processed in the Financial Aid Office and are then forwarded to the student's bank or to his parents' bank. Applications are accepted throughout the school year.

Emergency Aid (Small Loans). A student in good standing and in immediate need because of an emergency may apply for aid in amounts up to \$15 by contacting the Dean of Men or the Dean of Women, who administer the Dean of Men and the Dean of Women Emergency Aid and the Faculty Women's Club Emergency Fund.

Student Employment

The Office of Student Employment, as a division of the Office of Financial Aid, administers the federal College Work-Study Program. A significant part of on-campus student employment, as well as some off-campus employment, is under the Work-Study Program. A student interested in employment generally, and in the Work-Study Program in particular, should contact the office four to six weeks before the date he will be available for employment. Completed financial aid forms are mandatory for all students participating in the Work-Study Program, and appointments are subject to yearly reconsideration and renewal.

Counseling for the Work-Study Program and for students with special employment problems is provided.

Liaison between prospective employers and students desiring full, part-time, or seasonal employment is provided by this office. Placement through the office includes all on-campus, off-campus, and work-study job opportunities. The job listings on file in the Job Center encompass a wide variety of jobs, wage rates, and schedules to meet student needs. Employment in special programs or projects for marketing, English, engineering, and science majors, to indicate a few, is also offered.

The Office of Financial Aid will be pleased to hear from students interested in any type of financial aid described herein. Students are invited to contact the office by telephone, in person, or by mail:

The Office of Financial Aid
816 University Hall
The University of Illinois at Chicago Circle
P.O. Box 4348
Chicago, Illinois 60680
Telephone: 663-3126

The Office of Organizations and Activities

More than 85 recognized student organizations at Chicago Circle are assisted by this office in the conduct of their constitutional, financial, and social functions. Out-of-class activities and organizations are encouraged as a part of the broad education of the student, through which he may prepare himself for informed membership, including leadership, in community affairs.

The range of student organizations includes educational, preprofessional, political, religious, social-issue, arts, literary, and recreational groupings. Additional organizations will be formed with further development of the campus.

Foreign Student Affairs

Foreign students are assisted in evaluating their abilities, planning their programs, and interpreting regulations applicable to them. This service includes assistance on problems of extension of stay, employment, border crossing, and details of maintaining legal status, housing, and understanding of the American way of life.

Placement Services

Seniors and graduate students who will begin their careers immediately after they are graduated are encouraged to register at the Placement Office for counseling, for aid in getting in touch with employers, and for planning and scheduling interviews with those representatives of business firms, government agencies, and nonprofit organizations who visit the Chicago Circle campus in the fall and winter quarters. In recent years, employers have made it a practice to *complete* their on-campus interviewing *before the spring quarter starts*. A student should register early in his last year to avoid missing important interviews with representatives of employers from all over the United States. Juniors may register shortly before entering their senior year.

The aims of the Placement Office are: to assist the University graduate in making a wise and responsible choice of a career for his own greatest satisfaction, to eliminate wasteful turnover, and to assist the graduate in achieving the most fruitful long-term investment of his talents for himself, for his employer, and for society.



The College of Architecture and Art

Leonard J. Currie, M.Arch., Dean of the College

Edward L. Deam, M.Arch., Associate Dean

Rowland Rathbun, M.S., Assistant Dean

The College of Architecture and Art serves as a center for study and investigation in the visual and plastic arts and offers professional curricula in architecture and in several specialized areas. Emphasis is on the creative process within a broadly cultural educational program. Architecture and the arts are considered in their social context as a reflection of the highest aspirations of contemporary culture and as expressions that give meaning and purpose to human life. Principles and methodology are stressed rather than resultant form and changing styles.

All work submitted by students for credit in any course in any Department in the College of Architecture and Art belongs to the Board of Trustees of the University of Illinois, and the University reserves the right to retain, hold, copyright, use, exhibit, reproduce, and publish any work so submitted by any student for credit in any course.

The Department of Architecture

R. Thomas Jaeger, M.Arch., Acting Head of the Department

Kenneth W. Schaar, M.A., Assistant to the Head

Professors: Alvin S. Boyarsky, M.R.P.; Leonard J. Currie, M.Arch.; Edward L. Deam, M.Arch.; Charles B. Genther, B.S.; Robert W. Gerstner, Ph.D.; Donald D. Hanson, M.Arch.; George A. Hinds, M.C.P.; Harold B. McEldowney, B.A. (Emeritus); George J. Megarefs, Ph.D.; Henry L. Mikolajczyk, M.Arch.; Stanley Tigerman, M.Arch.; Frederick W. Wiesinger, Ph.D.

Associate Professors: Robert K. Adams, M.S.; Rene Amon, Ph.D.; Jakob D. Blumer, *Dipl. Arch.*; Anthony J. DeFilipps, B.S.; Peter W. Gyax, *Dipl. Arch.*; R. Thomas Jaeger, M.Arch.; Hinman L. P. Kealy, M.C.P.; Graeme M. Morland, R.I.B.A.; Rowland Rathbun, M.S.; Louis I. Rocah, M.S.; Roger G. Whitmer, M.S.

Assistant Professors: Elliott E. Dudnik, M.S.C.E.; Michael S. Gelick, M.F.A.; David L. Kal, M.Arch.; Philip A. Kupritz, M.Arch.; Jon L. Liljequist, J.D.; Richard J. Rothman, M.A.

Lecturers: Lawrence O. Booth, B.Arch.; Lloyd D. Gadau, B.Arch.; Maurice Gamze, B.S.M.E.; Andrew Heard, B.Arch.; Edward S. Hoffman, B.S.C.E.; William V. Kehoe, Jr., B. Arch.; Robert G. Lukas, M.S.; James L. Nagle, M.Arch.; Kenneth W. Schaar, M.A.; Donald R. Sunshine, B.Arch.; Anthony Tadin, B.S.C.E.

The curriculum in architecture is structured to provide the student with the initial steps in the lifelong process of qualification required to fulfill the social responsibilities of the architect.

Architecture is the art and science of building to satisfy the environmental needs of man. Within those needs, it is the architect's responsibility to analyze the inherent social, psychological, and physical factors and to translate them creatively, through the act of design, into an appropriate physical environment. Thus, as society evolves, so too does the role of the architect. Today, society has charged architecture and its codiscipline, planning, with far greater social and physical responsibilities than ever before, responsibilities that are best exemplified by the term "urbanism." The results of poverty, social disorder, and an unaccommodating environment in a rural area are quite different in impact than are these same factors in an urban environment, where they foster social, moral, and economic decay and, eventually, total cultural disintegration.

Inherent in the architect's professional success is the potential of the "good life" for the majority of the world's population and the cultural growth and development of its societies. To achieve this potential, the historical evolution of architecture is presented to the students as a matrix for the social, structural, and aesthetic aspects of the profession. The successful student learns to think for himself, to solve problems, to avoid histrionics, and to see the world around him both as it is and as it could be. The factors implicit in architecture are numerous, weighted, variable, and interdependent. Hence, it is through a balanced, flexible sequence of courses in design, building technology, structures, and the humanities that the student is encouraged to identify and to place into context these many factors.

The first, or foundation, year is common for all students in the department; the second, third, and fourth years provide a common base; the fifth year, during which the student completes his major and minor emphases, offers a maximum of flexibility for a degree program in one of the following:

Architectural Humanities
Building Technology

Design
Structures

The curriculum in architecture requires 239 quarter hours for graduation, exclusive of military training and required physical education. See *Requirements for Admission to Undergraduate Study* for the admission requirements of the department. The candidate is then eligible for recommendation for the degree of Bachelor of Architecture in one of the above areas.

The Curriculum in Architecture

The courses offered in the fourth (summer) quarter are identical with those offered in the second (winter) quarter.

First Year

<i>First Quarter</i>	<i>Hours</i>
Architecture and Art 101—Basic Design I	3
Architecture and Art 111—Visual Communications I	2
Architecture and Art 141—Man and Environment	3
Mathematics 111*—Introduction to Analysis I	3-5
Rhetoric 101—Freshman Rhetoric and Composition	4
Physical Education	(1)
	<hr/> 15-17

Second Quarter

Architecture and Art 102—Basic Design II	3
Architecture and Art 112—Visual Communications II	2
History of Architecture and Art 142—History of Architecture and Art I	4
Mathematics 112*—Introduction to Analysis II	3-5
Rhetoric 102—Freshman Composition and Rhetoric	4
Physical Education	(1)
	<hr/> 16-18

Third Quarter

Architecture and Art 103—Basic Design III	3
Architecture and Art 113—Visual Communications III	2
History of Architecture and Art 143—History of Architecture and Art II	4
Mathematics 194*—Introduction to Automatic Digital Computing	3-5
Sociology 100—Introduction to Sociology	4
Physical Education	(1)
	<hr/> 16-18

*Required for all students who elect a design or humanities major. Structures and building technology majors must substitute Mathematics 130, 131, 132.

Second Year

<i>First Quarter</i>	<i>Hours</i>
Architecture and Art 104—Basic Design IV	3
Architecture and Art 114—Visual Communications IV	2
Architecture 121—Statics and Strength of Materials I	3
History of Architecture and Art 144—History of Architecture and Art III	4
Physics 101—General Physics (Mechanics and Heat)	5
Physical Education	(1)
	<hr/> 17

Second Quarter

Architecture 101—Architectural Design I	6
Architecture 122—Statics and Strength of Materials II	3
Elective—from History of Architecture and Art 231 through 238	4
Physics 102—General Physics (Electricity and Magnetism and Waves)	5
Physical Education	(1)
	<hr/> 18

Third Quarter

Architecture 102—Architectural Design II	6
Architecture 111—Building Technology I	4
Architecture 123—Statics and Strength of Materials III	3
Physical Science Elective	4
Physical Education	(1)
	<hr/> 17

Third Year*First Quarter*

	<i>Hours</i>
Architecture 201—Architectural Design III	6
Architecture 211—Building Technology II	4
Architecture 221—Structural Engineering I	3
Sociology 276—Sociology of Urban Life in Industrial Society	4
	<hr/> 17

Second Quarter

Architecture 212—Building Technology III	4
Architecture 222—Structural Engineering II	3
Art Elective(s)*	5
Elective (social sciences or humanities)	4
	<hr/> 16

Third Quarter

Architecture 202—Architectural Design IV	6
Architecture 213—Building Technology IV	4
Architecture 223—Structural Engineering III	3
Architecture 241—Urban and Regional Planning I	3
	<hr/> 16

*Structures and building technology majors must substitute Mathematics 195 for 3 hours of art electives.

Fourth Year*First Quarter*

	<i>Hours</i>
Architecture 203—Architectural Design V	6
Architecture 214—Building Technology V	4
Architecture 224—Structural Engineering IV	3
Architecture 242—Urban and Regional Planning II	3
	<hr/> 16

Second Quarter

Architecture 204—Architectural Design Problems	6
Architecture 215—Building Technology VI	4
Architecture 225—Structural Engineering V	3
Elective—from History of Architecture and Art 231 through 238	4
	<hr/> 17

Third Quarter

Architecture 226—Structural Engineering VI	3
Art Elective(s)	5
Elective—from History of Architecture and Art 231 through 238	4
Elective (social sciences or humanities)	4
	<hr/> 16

Fifth Year

The fifth year is elective except Architecture 343—Professional Practice. The student will take 6 hours in his elected major in the first and second quarters and will prepare a thesis in his third quarter.

First Quarter

	<i>Hours</i>
History of Architecture and Art 231 through 238 ¹ , 331, 332; Architecture 301, 312, 313, 314, 321, 322, 323. These courses cover the major emphases; the student enrolls in those pertinent to his option for a total of	12
Elective (social sciences or humanities)	4
	<hr/> 16

Second Quarter

History of Architecture and Art 231 through 238 ¹ , 332, 333; Architecture 302, 311, 315, 316, 324, 325, 326. These courses cover the major emphases; the student enrolls in those pertinent to his option for a total of	12
Architecture 343—Professional Practice	3
	<hr/> 15

Third Quarter

Architecture 309 or 319 or 329 or 339—Thesis in the student's option.	12
Elective (social sciences or humanities)	4
	<hr/> 16

Notes: For course descriptions, see *Courses of Instruction*.

General Education: A minimum of 9 hours in the social sciences and 9 hours in the humanities is required of all degree candidates.

Courses in the College of Engineering can be substituted for equivalent structures courses in the College of Architecture if the student's adviser consents.

¹For students in architectural humanities.

The Department of Art

John E. Walley, Acting Chairman of the Department
Raymond A. Dalton, M.S., Administrative Assistant

Professors: Roland F. Ginzel, M.F.A.; Martin R. Hurtig, M.S.; Richard Koppe; Alfred P. Maurice, M.A.; Robert W. Nickle, B.A.; John F. Richardson, M.A.; Simon Steiner, M.S.; John E. Walley.

Associate Professors: Morris Barazani; Leonard Bellin, M.A.; Nancy D. Berryman, Ed.D.; Edward E. Burr, B.F.A. (Emeritus); Eugene Dana, M.Des.; Donald P. Dimmitt, B.S.; Nancy R. Stableford, M.F.A.; Tadao Takano, B.S.

Assistant Professors: William S. Becker, M.F.A.; Wayne A. Boyer, B.S.; Klindt B. Houlberg, M.A.; Joseph D. Jachna, M.S.; Jerald W. Jackard, M.A.; John H. Pacyna, M.F.A.; Lawrence Salomon, M.A.; Stuart Schar, Ph.D.; Irene Siegel, M.S.; Leonard D. Singer, M.S.Des.; Robert W. Stiegler, B.S.; Guenther Tetz, M.F.A.

Instructors: Basil T. Argeropolos, M.F.A.; Richard F. Baronio, M.F.A.; Lawrence Charak, B.S.; Raymond A. Dalton, M.S.; Michael J. Elliston, B.S.; Susan B. Hawes, B.S.; Allan H. Phillips, M.F.A.; Daniel Sandin, M.S.; Hans K. Schaal, M.S.; Herbert D. Slobin, M.S.; Rimvydas Tveras, B.F.A.; George Wead, M.A.

Lecturers: Lawrence G. Klein; Nathan Lerner, B.S.; Keith A. Morrison, M.F.A.; Allen E. Porter; Gillian Wise.

The artist has the task of providing insights into and meaning for events and of giving form to the objects that compose our physical environment. To do this he must be familiar with the ideas and dilemmas of his time, and he must be capable of using the tools that are necessary to make creative statements.

The program of the Department of Art is designed to stimulate the student's creative activity, to heighten his intellectual capabilities, and to develop the essential skills for acting effectively in a technological, industrial society.

The foundation program is a requirement for all entering freshmen and may be a requirement for transfer students. It consists of a series of courses numbered Art Design 101 through 106, 111 through 116, and 141. Art transfer students from other institutions are normally required to initiate their work at Chicago Circle by taking Art Design 200, 201, and 141.

With the completion of the foundation requirement, a student may elect a program concentration that will result in a high professional emphasis in these areas: communications design, industrial design, painting, photography and film, printmaking, and sculpture. If he prefers, he may follow a broad pattern of course selection.

For course descriptions, see *Courses of Instruction*.

Degree Requirements	<i>Hours</i>
Foundation courses (includes art history)	45
Upper-division courses in the Department of Art	60
Art, history of architecture and art, or architecture	18
General education courses (outside the College of Architecture and Art)	66
Physical education	6
Total	195

Art Education

The student who desires to major in and qualify for a degree in art education must enroll in these general education courses:

	<i>Hours</i>
Education 170, 210, 230, 250, 270	28
Speech 100, 101	5
Political Science 151	4
Psychology 100	4
The student also will include in his upper-division art courses:	
Art 205, 213	8

The Curriculum in Art

First Year	<i>Hours</i>
Art-Design 101, 102, 103—Basic Design I, II, III	9
Art-Design 111, 112, 113—Visual Communications I, II, III	6
History of Architecture and Art sequence*	8
Art-Design 141—Man and Environment	3
	26
Second Year	
Art-Design 104, 105, 106—Basic Design IV, V, VI	9
Art-Design 114, 115, 116—Visual Communications IV, V, VI	6
History of Architecture and Art sequence*	4
	19
Upper Division—Junior and Senior	
Courses in Department of Art	60
Art, History of Architecture and Art, Architecture	18
	78

*History of Architecture and Art 142, 143, 144 *or*

History of Architecture and Art 115 and two 200-level courses *or*

Art 100, 101, and 103 *or*

a sequence of general education courses approved by the student's adviser.

General Education Requirements

In addition to the above courses, the student must complete general education courses that include Rhetoric 101 and 102, the humanities, the social sciences, and the natural sciences.

Physical Education

66

6

72

The Department of History of Architecture and Art

John D. McNee, M.A., Chairman of the Department

H.F. Koeper, Ph.D., Acting Chairman

Professors: H. F. Koeper, Ph.D.; John D. McNee, M.A.; Horst de la Croix, Ph.D. (Visiting).

Assistant Professors: Ross Edman, M.A.; Carol L. LaBranche, Ph.D.

Instructors: Richard G. Arms, M.A.; Devin Burnell, M.A.; Ethel Hammer, M.A.; Jethro M. Hurt III, M.A.; Nell Johnson, M.A.; Francis M. Light, M.A.; Mary Carmen Lynn, M.A.; George Wead, M.A.

Lecturers: Ann W. Goodfellow, M.A.

Curriculum in the History of Architecture and Art

For the degree of Bachelor of Arts, 180 hours in required courses in the Department and the College, in general education courses, and in electives. See *General University Requirements*.

Foundation Courses (Freshman year)

Architecture and Art 101, 102, 103—Basic Design I, II, III

Architecture and Art 111, 112, 113—Visual Communications I, II, III

History of Architecture and Art 142, 143, 144—History of Architecture and Art I, II, III

Courses for the Major

40 hours of architecture and art courses at the 200 and 300 levels, 16 hours of which are in one of the six areas of concentration and one course from each of three other areas:

Ancient and Classical art

Medieval and Byzantine art

Renaissance and Baroque art

American and Modern art

Oriental art

Architecture

8 hours in the history of architecture

4 hours in oriental art

History of Architecture and Art 291—Art History Tutorial

4 hours from History of Architecture and Art 333, 391, 392

See *Courses of Instruction* section for course descriptions.

A reading knowledge of one modern language, usually French, Spanish, Italian, or German, should be attained by the end of the junior year.

A minor is not required.

Departmental Distinction: A candidate must have a 4.000 all-University grade-point average, a 4.500 grade-point average in history of architecture and art courses beyond the 100 level, and must pass a departmental comprehensive examination.



The College of Business Administration

Irvin L. Heckmann, Ph.D., Dean of the College
William J. Dunne, M.B.A., Associate Dean
Norman S. Smith, B.S., Assistant Dean
Gus Economos, M.B.A., Director of Special Projects

The degree program in the College of Business Administration is designed to provide students with a well-rounded education in preparation for careers in business administration and for careers that require training in economics. The curriculum includes courses in general education and in the various functional fields of business administration. It also allows a student to acquire skills in his chosen area of specialization.

The general education requirements provide a liberal education background and skills and tools that will enable the student to take full advantage of his academic experience. Thus, courses in mathematics, laboratory sciences, rhetoric, social sciences, behavioral sciences, and humanities enable the student to learn and to perform at a higher level throughout his lifetime. The business core courses provide basic knowledge about the different areas of business. Courses in accounting, economics, finance, management, marketing, and quantitative methods constitute the business core curriculum.

Finally, the College offers courses that enable the student to acquire specialized training in the area of his choice and to acquire a foundation on which to base further study by learning through additional academic training or through professional experience.

Professors: Eliezer B. Ayal, Ph.D., Economics (Visiting); Bernard H. Baum, Ph.D., Management; Edwin Cohen, Ph.D., C.P.A., Accounting; Raymond W. Coleman, Ph.D., Economics and Management (Emeritus); Lucile Derrick, Ph.D., Quantitative Methods; Samuel Fox, J.D., Ph.D., C.P.A., F.I.B.A., F.I.A.L.S., Accounting; Clarence H. Gillett, Ph.D., Management (Emeritus); Brian Gluss, Ph.D., Quantitative Methods; William Grampp, Ph.D., Economics; Irvin L. Heckmann, Ph.D., Management; S. George Huneryager, Ph.D., Management; Leonard Kent, Ph.D., Quantitative Methods; Richard F. Kosobud, Ph.D., Economics; Carl M. Larson, M.B.A., Marketing; Alfonse T. Malinosky, M.B.A., C.P.A., Accounting; Raymond L. Richman, Ph.D., Economics; Albert J. Schneider, M.B.A., C.P.A., Accounting; Sherman Shapiro, Ph.D., Economics; William W. Tongue, Ph.D., Economics and Finance; Robert E. Weigand, Ph.D., Marketing.

Associate Professors: Hale C. Bartlett, Ph.D., Management; William J. Dunne, M.B.A., Management; Gus Economos, M.B.A., Management (Visiting); Bert E. Elwert, Ph.D., Economics and Management; Ronald E. Jablonski, D.B.A., Management; S. Madonna Kabbes, M.B.A., C.P.A., Accounting (Emerita); Maybelle Kohl, Ph.D., C.P.A., Accounting (Visiting); Oscar Miller, M.A., Economics; Edward T. Ossman, M.B.A., C.P.A., Accounting; Fayette B. Shaw, Ph.D., Finance.

Assistant Professors: Robert D. Auerbach, Ph.D., Economics; Richard D. Babcock, M.B.A., Management; Robert L. Crabb, M.A., C.P.A., Accounting; Laurence Feldman, Ph.D., Marketing; Winifred B. Geldard, M.B.A., C.P.A., Economics (Emerita); Thomas A. Johnson, J.D., Ph.D., Economics; Mildred Levy, Ph.D., Economics; Josephine A. Margraff, M.B.A., Accounting; Ronald L. Miller, Ph.D., Management; Ronald P. Moses, Ph.D., Economics; Brian Parsons, M.B.A., Accounting; LeRoy Pryor, M.B.A., C.P.A., Accounting; Lalitha P. Sanathanan, Ph.D., Quantitative Methods; Mary Jane Schlinger, Ph.D., Marketing; Arthur D. Seltzer, M.A., Economics; Shlomo Shalit, Ph.D., Economics; Andrew F. Sikula, Ph.D., Management; Allen Sinai, Ph.D., Economics; Houston H. Stokes, Ph.D., Economics; Frederick G. Stubbs, Jr., Ph.D., Finance; William M. Sukel, M.B.A., Management; Joseph A. Wolfe, M.S., Management.

Instructors: Donald E. Baer, M.A., Economics; John S. Bildersee, M.B.A., Finance; Edward J. Coman, M.B.A., C.P.A., Accounting; Michael Edesess, M.S., Quantitative Methods; Frances V. Flanagan, M.A., Economics; Kurt F. Hausafus, B.A., Economics; William R. Pokross, M.C.A., Economics; James P. Smith, B.S., Economics; Norman S. Smith, B.S., Economics; Donald Steinnes, M.A., Quantitative Methods.

Lecturers: George C. Catsiapis, M.S., Finance; Stanford J. Cole, M.B.A., C.P.A., Accounting; Donald E. Henschel, M.B.A., Quantitative Methods; Wallace E. Huffman, B.S., Economics; Nicholas J. Mathys, M.B.A., Management; Michael S. McPherson, M.A., Economics; James R. Mensching, M.B.A., Quantitative Methods; Herbert E. Neil, Jr., Ph.D., Finance; Robert J. Smith, M.B.A., Accounting; Alvin D. Star, Ph.D., Marketing; Eric S. Stein, M.A., Marketing; Rolf H. Stetter, M.B.A., C.P.A., Accounting; Fred R. Travis, M.B.A., Management.

Graduation Requirements

A minimum of 186 hours, exclusive of the required 6 hours of physical education, is required for the degree of Bachelor of Science in Business Administration, distributed as follows:

	<i>Hours</i>
General education	93
Business core curriculum	61
Area of specialization and electives— approved by the area (department)	32
	<hr/> 186

Summary of Graduation Requirements

General Education Requirement

	<i>Hours</i>
Rhetoric 101, 102, Freshman Rhetoric and Composition	8
Mathematics 110, 111, 112 ¹ ,—Finite Mathematics and Introduction to Analysis I, II	11

Laboratory science sequence*	12
Humanities sequence*	12
Philosophy 102—Elementary Logic	4
Social Sciences:	
Behavioral (anthropology, psychology, or sociology)	8
Economics 120, 121—Principles of Economics I, II	8
History and/or political science	8
Fine arts	3
General education electives	19
	<hr/> 93

¹This sequence is for the student who enters the College with credit in college algebra. If he does not have such credit, he takes the Mathematics Placement Test before he registers in the College. His score determines whether he enrolls in Mathematics 100 or 104, neither of which carries credit.

*Refer to the following table for approved sequences in the humanities, the natural sciences, and the fine arts.

Approved Sequences for Fulfillment of the General Education Requirement Humanities, Natural Sciences, and Fine Arts

Humanities

History of Architecture and Art
12 hours including HAA 115 and
8 hours selected from HAA 142,
143, 144 or any 200-level HAA
courses.

English

101, 102, 103
150, 151, 152
190, 191, 192

Humanities

101, 102, 103

French

201, 202, 203*

German

3 courses in literature,
200-level or above, one of
which may be in translation*

Spanish

221, 222, 223*
240, 241, 242*

French 185, German 185,
Spanish 240 or 241*

Music

130, 131 and one course
from 215, 216, 217, 218
219, 220

Philosophy

201, 203 and one additional
course

Speech

121, 122, 123

Natural Sciences (laboratory)

Biological Sciences
100, 101, 102

Chemistry

112, 113, 114
113, 114, 121
117, 118, 119

Geography

101, 102, 103

Geological Sciences

101, 102, 103

Natural Sciences

121, 122, 123

Physical Sciences

101, 102, 103

Physics

101, 102, 103

Fine Arts

Recommended:

Architecture

241

Music

A minimum of 3 hours

Art

100 or 101 or 103

Speech and Theatre

121 or 329

History of Architecture and Art

A minimum of 3 hours

*These 9-hour or 10-hour sequences are the only exception to the general requirement of 12-hour sequences. The additional hours must be made up in general education courses.

General Education Course Sequences for Transfer Students**Transfer Students Entering With: Additional Requirements***

6 semester hours of humanities survey or 6 other hours of humanities in sequence	Any course in any field of the humanities
6 semester hours of biology	Any one of Biological Sciences 100, 101, 102
6 semester hours of physical science with laboratory	One laboratory course in physical science
3 or 4 semester hours of biology	Any two of Biological Sciences 100, 101, 102
3 or 4 semester hours of physical science survey	Two courses in physical science (laboratory)
3 semester hours of humanities survey	Two courses in sequence in humanities

Business Core Requirements

	<i>Hours</i>
Accounting 100, 101, 102—Accounting I, II, III	9
Economics 320—Macroeconomic Theory	4
Economics 321—Microeconomic Theory	4
Economics 322—Managerial Economics or Economics 323—Business Conditions Analysis	4
Quantitative Methods, 270, 271, 272—Statistics I, II, III	12
Finance 340—Money and Banking	4
Finance 341—Business Finance	4
Marketing 360—Principles of Marketing	4
Management 350—Organization and Administration	4
Management 351—Organization Theory	4
Management 359—Business Policy	4
Business Law 310—Managerial Jurisprudence	4
	<hr/> 61

*To fulfill a sequence requirement, a student must satisfactorily complete a course (or courses) or equivalent for which he has no previous credit.

Student Responsibility for Course Selection

Under the condition that he is making satisfactory progress toward his degree, the *responsibility* for course selection rests with the student. "Satisfactory progress toward the degree" is defined as meeting *all* the requirements listed below:

- A. Each student must carry not less than 12 and not more than 19 hours each quarter. This applies to students on probation as well as to those in good standing. Only the Assistant Dean's approval can alter this requirement.
- B. Every student *must* enroll in mathematics *every quarter*, beginning with his first quarter at Chicago Circle, until the Mathematics 110, 111, 112 sequence is completed.
- C. All sophomores *must* enroll (1) in Economics 120, 121 and (2) in Accounting 100, 101, 102. These courses must be completed *before* the junior year.
- D. Students must enroll in Quantitative Methods 270, 271, 272 as soon as possible, preferably in the sophomore year. These courses must be completed by the end of the junior year.
- E. Students must enroll in a minimum of 12 quarter hours that apply toward the degree or in courses which are prerequisite to courses that count toward the degree.
- F. Transfer students must fulfill freshman and sophomore requirements as quickly as possible and must fulfill all the foregoing requirements.

Important: Courses taken to fulfill one requirement may not be used to fulfill any other requirement.



**A Typical Program in the College of Business Administration
Common to All Areas Except Quantitative Methods**

Quarter Class	1		2		3	
	Course	Hours	Course	Hours	Course	Hours
<i>Freshman</i>	Math 110*	5	Math. 111	3	Math. 112	3
	Rhet. 101	4	Rhet. 102	4	Phil. 102	4
	Science (Lab)	4	Science (Lab)	4	Science (Lab)	4
	Humanities	4	Humanities	4	Humanities	4
	P.E.M. (W)	<u>1</u>	P.E.M. (W)	<u>1</u>	P.E.M. (W)	<u>1</u>
	Total	18	Total	16	Total	16=50
<i>Sophomore</i>	Actg. 100	3	Actg. 101	3	Actg. 102	3
	Econ. 120	4	Econ. 121	4	Fin. 340	4
	Q.M. 270	4	Q.M. 271	4	Q.M. 272	4
	Beh. Sci. or Hist. or PolS	4	Beh. Sci. or Hist. or PolS	4	Beh. Sci. or Hist. or PolS	4
	P.E.M. (W)	<u>1</u>	P.E.M. (W)	<u>1</u>	P.E.M. (W)	<u>1</u>
	Total	16	Total	16	Total	16=48
<i>Junior</i>	Econ. 320	4	Econ. 321	4	Econ. 322 or	
	Mgmt. 350	4	Fin. 341	4	323	4
	Mktg. 360	4	Mgmt. 351	4	Area of Concen.	
	Hist. or PolS or Beh. Sci.	<u>4</u>	Area of Concen. or Elective	4	or Elective	8
					Gen. Ed. Elec.	4
	Total	16	Total	16	Total	16=48
<i>Senior</i>	Bus. Law 310	4	Gen. Ed. Elec.	8	Mgmt. 359	4
	Fine Arts	3	Area of Concen.		Area of Concen.	
	Gen. Ed. Elec.	4	or Elective	8	or Elective	8
	Area of Concen. or Elective	<u>4</u>			Gen. Ed. Elec.	3
	Total	15	Total	16	Total	15=46

*In the freshman year the student should begin with Mathematics 110 if his placement test indicates so. Otherwise, he should select the mathematics course indicated by placement.

The Departments

Accounting

Accounting is concerned with (1) the measurement of income and wealth derived from economic enterprise and (2) the communication of information about the financial condition of and the results of activities of economic

organizations. The specific functions include management control, tax management, and the attest function.

- Required Courses—32 hours, distributed as follows:
- Accounting 301—Asset Valuation and Income Determination, 4 hours
 - Accounting 302—Accounting for Entity Interest, 4 hours
 - Accounting 300—Managerial Cost Accounting, 4 hours
 - Accounting 303—Auditing, 4 hours
 - Accounting 304—Federal Income Tax, 4 hours
- Plus two from the following (8 hours):
- Accounting 305—Planning and Control, 4 hours
 - Accounting 306—Readings and Advanced Problems, 4 hours
 - Quantitative Methods 375—Information Systems I, 4 hours
 - Quantitative Methods 376—Information Systems II, 4 hours
 - Quantitative Methods 370—Multivariate Analysis, 4 hours
 - Mathematics 194—Introduction to Automatic Digital Computing. 4 hours
 - Economics 335—Econometrics, 4 hours
- Electives approved by the area (department), 4 hours

Suggested Course Schedule for Accounting Majors

Junior Year		Senior Year	
<i>First Quarter</i>		<i>First Quarter</i>	
Accounting 301	4	Accounting 303	4
Economics 320	4	Behavioral science or history	
Marketing 360	4	or political science	4
Management 350	4	General education elective	5
	16	Humanities	4
			17
<i>Second Quarter</i>		<i>Second Quarter</i>	
Accounting 302	4	Accounting 304	4
Economics 321	4	Business Law 310	4
Finance 341	4	Accounting or business	
Management 351	4	elective	4
	16	Humanities	4
			16
<i>Third Quarter</i>		<i>Third Quarter</i>	
Accounting 300	4	Accounting elective	4
Economics 322 or 323	4	Management 359	4
Behavioral science or history		General education elective	4
or political science	4	Humanities	4
Fine arts	3		16
General education elective,			
Accounting elective	3		
	18		

Economics

Economics deals with determinants of the general level of employment, production, and income and the principles of allocating resources to maximize benefits to the public. It provides the essential background for applications in business administration and the social sciences.

Required Courses—32 hours, distributed as follows:

Four courses from the designated area with at least one from each area for a total of 16 hours.

Area I

Economics 324—Economic History of the United States, 4 hours

Economics 325—Economic History of Europe, 4 hours

Economics 326—History of Economic Thought, 4 hours

Area II

Economics 327—Comparative Economic Systems, 4 hours

Economics 328—Government Finance, 4 hours

Economics 329—Industrial Organization, 4 hours

Economics 330—Government and Business, 4 hours

Economics 331—Labor Economics, 4 hours

Economics 332—Urban Economics, 4 hours

Economics 398—Independent Study in Economics*

Economics 399—Special Topics in Economics*

*Hours of credit depend on arrangement with instructor.

Area III

Economics 322—Managerial Economics, 4 hours, or

Economics 323—Business Conditions Analysis, 4 hours**

Economics 333—International Economics, 4 hours

Economics 334—Economic Development, 4 hours

Economics 335—Econometrics, 4 hours

Electives approved by the area (department), 16 hours

**Whichever is not elected to satisfy the Core requirement.

The remaining 16 hours may be taken in any other courses in the College of Business Administration or in other Colleges (except courses in military science and physical education). Courses taken at other institutions may be used if transfer credit is granted by the College of Business Administration.

Suggested Course Schedule for Economics Majors

Junior Year

<i>First Quarter</i>	<i>Hours</i>
Economics 320	4
Management 350	4
Marketing 360	4
Behavioral science or history or political science	4
	<hr/> 16

Second Quarter

Economics 321	4
Finance 341	4
Management 351	4
Behavioral science or history or political science	4
	<hr/> 16

Senior Year

<i>First Quarter</i>	<i>Hours</i>
Business Law 310	4
Humanities	4
General education elective	5
300-level economics course	4
	<hr/> 17

Second Quarter

Humanities	4
General education elective	4
300-level economics course	4
Free elective	4
	<hr/> 16

Third Quarter

Economics 322 or 323	4
Fine arts	3
300-level economics course	4
General education elective	4
	<hr/>
	15

Third Quarter

Management 359	4
Humanities	4
300-level economics course	4
Elective	4
	<hr/>
	16

Finance

The finance curriculum explores the influence of the monetary and banking system on the general business level, the principles of financial analysis and control as applied to individual business firms, and economic and financial factors bearing on the valuation and selection of securities.

- Required Courses—32 hours, distributed as follows:
- Finance 342—Investments, 4 hours
 - Finance 343—Risk and Insurance, 4 hours
 - Finance 344—Investment Policy, 4 hours
 - Finance 345—Problems in Business Finance, 4 hours
 - Electives approved by the area (department), 16 hours+

Suggested Course Schedule for Finance Majors

Junior Year

First Quarter	Hours
Economics 320	4
General education elective	4
Management 350	4
Behavioral science or history or political science	4
	<hr/>
	16

Second Quarter

Economics 321	4
Marketing 360	4
Management 351	4
Behavioral science or history or political science	4
	<hr/>
	16

Third Quarter

Accounting 301	4
Finance 341	4
Fine arts	3
Finance 343	4
	<hr/>
	15

Senior Year

First Quarter	Hours
Business Law	4
Humanities	4
Finance 342	4
General education elective	5
	<hr/>
	17

Second Quarter

Finance 344	4
Humanities	4
Finance 345	4
Economics 323*	4
	<hr/>
	16

Third Quarter

Management 359	4
Humanities	4
General education elective	4
Economics 322*	4
	<hr/>
	16

*Recommended.

+These 16 hours may be taken in any other courses in the College of Business Administration or in other Colleges (except courses in military science and physical education). Courses taken at other institutions may be used if transfer credit is granted by the College of Business Administration.

Management

The degree program in management provides students with a theoretical and practical preparation for assuming responsible managerial and executive positions in a variety of working organizations. All specialized options within the management area emphasize analytical preparation for effective decision making and for broadening preparation for leadership positions.

Required Courses—32 hours, distributed as follows:

1. Management 352—Administrative Practices, 4 hours
2. Two courses from the following fields—8 hours:

Operations and Systems Management

This option provides the student with a sound background in the management sciences and in the production function common to all work organizations. Emphasis is upon computer applications, management information systems, and materials management.

For specialists in operations and systems management:

Management 356—Operations and Systems Management I, 4 hours.

Management 357—Operations and Systems Management II, 4 hours.

Personnel and Industrial Relations

Personnel and industrial relations is concerned with the effective utilization of human resources within work organizations. Emphasis is on the behavior of people at work and the staff programs available to managers for more effectively utilizing people at work and for coping with human problems. Union-management relations are also explored.

For specialists in personnel and industrial relations:

Management 353—Personnel Management, 4 hours

Management 354—Industrial Systems, 4 hours

General Administration

The emphasis of the general administration program is on acquainting students with the many and varied aspects of the manager's role in complex working organizations. Stress is placed upon the internal dynamics of complex work organizations, the structural components, and the many personal and interpersonal problems of the manager.

For general administration background students: a combination of the above options with the consent of the adviser.

3. Three courses from the following areas—12 hours:
 - A. Management 360—Business, Society, and Technology, 4 hours
 - B. One course from an approved 300-level business core
 - C. One approved 200-level or 300-level course outside of business
4. Electives approved by the area (department), 8 hours

Suggested Course Schedule for Management Majors

Junior Year

<i>First Quarter</i>	<i>Hours</i>
Economics 320	4
Management 350	4
Marketing 360	4
Behavioral science or history	
or political science	4
	<hr/> 16

Senior Year

<i>First Quarter</i>	<i>Hours</i>
Business Law 310	4
Humanities	4
General education elective	5
Major subject	4
	<hr/> 17

<i>Second Quarter</i>	
Economics 321	4
Finance 341	4
Management 351	4
Behavioral science or history or political science	4
	<hr/> 16
<i>Third Quarter</i>	
Economics 322 or 323	4
Fine arts	3
Management 352	4
General education elective	4
	<hr/> 15

<i>Second Quarter</i>	
Humanities	4
General education elective	4
Major subject	8
	<hr/> 16
<i>Third Quarter</i>	
Management 359	4
Humanities	4
Major subject	8
	<hr/> 16

Marketing

Modern marketing management involves the integration of materials from diverse disciplines. Psychology, sociology, and other behavioral sciences contribute to a better understanding of consumer behavior, and quantitative methods are increasingly used in the analysis of marketing information.

- Required Courses—32 hours, distributed as follows:
Marketing 361—Consumer Market Behavior, 4 hours
Marketing 362—Marketing Research, 4 hours
Marketing 363—Marketing Organizations, 4 hours
Marketing 364—Managing Marketing Communications, 4 hours
Marketing 365—Marketing Management, 4 hours
Electives approved by the area (department), 12 hours

Suggested Course Schedule for Marketing Majors

Junior Year	
<i>First Quarter</i>	<i>Hours</i>
Marketing 360	4
Economics 320	4
Management 350	4
Behavioral science or history or political science	4
	<hr/> 16
<i>Second Quarter</i>	
Marketing 361	4
Economics 321	4
Management 351	4
Finance 341	4
	<hr/> 16
<i>Third Quarter</i>	
Marketing 362	4
Economics 322 or 323	4
Behavioral science or history or political science	4
Fine arts	3
	<hr/> 15

Senior Year	
<i>First Quarter</i>	<i>Hours</i>
Marketing 363	4
Business Law 310	4
Humanities	4
General education elective	5
	<hr/> 17
<i>Second Quarter</i>	
Marketing 364	4
Humanities	4
General education elective	8
	<hr/> 16
<i>Third Quarter</i>	
Marketing 365	4
Humanities	4
Management 359	4
Elective chosen by the Marketing Department	4
	<hr/> 16

Quantitative Methods

During the past few years there has been a rapid growth of a body of knowledge in which mathematics is applied to the analysis of business problems. These developments are based on techniques drawn from classical mathematics in areas such as matrix algebra, calculus, and probability theory. In addition, these developments have stimulated new types of mathematical analyses, such as linear programming, dynamic programming, theory of games, and other analytical techniques usually associated with operations research.

The Quantitative Methods Area in the College of Business Administration requires of its majors a thorough background in classical mathematics and up-to-date knowledge in many of the aspects of operations research and computer science. These will enable graduates to bring to the business world an analytical approach to the solution of business problems; also, government and other areas of public administration find a use for specialists in this area. Graduates can expect to find employment in such fields as systems analysis, computer center operation, statistical quality control, and sampling.

Required Courses—32 hours, distributed as follows:

Quantitative Methods 370—Multivariate Analysis, 4 hours

Quantitative Methods 371—Survey Research, 4 hours

Quantitative Methods 375—Systems, 4 hours

Quantitative Methods 376—Survey of Operations Research, 4 hours

Mathematics 348—Linear Transformations and Matrices, 5 hours

Mathematics 375—Probability II, 3 hours

Electives approved by the area (department), 8 hours

Typical Program in Quantitative Methods

Freshman Year

<i>First Quarter</i>	<i>Hours</i>
Mathematics 110	5
Rhetoric 101	4
Science (laboratory)	4
General education elective	3
Physical education	1
	<hr/> 17

<i>Second Quarter</i>	
Mathematics 132	5
Rhetoric 102	4
Science (laboratory)	4
General education elective	2
Physical education	1
	<hr/> 16

Sophomore Year

<i>First Quarter</i>	<i>Hours</i>
Accounting 100	3
Economics 120	4
Quantitative Methods 270	4
General education elective	4
Physical education	1
	<hr/> 16

<i>Second Quarter</i>	
Accounting 101	3
Economics 121	4
Mathematics 195	3
Quantitative Methods 271	4
Physical education	1
	<hr/> 15

Third Quarter

Fine arts	3
Mathematics 133	5
Philosophy 102	4
Science (laboratory)	4
Physical education	1
	<hr/>
	17

Junior Year

First Quarter

Behavioral Sciences	4
Economics 320	4
Management 350	4
Mathematics 370 ^a	3
Elective ^b	3
	<hr/>
	18

Second Quarter

Economics 321	4
Mathematics 348	5
Mathematics 375	3
Management 351	4
	<hr/>
	16

Third Quarter

Economics 322 or 323	4
Finance 341	4
Quantitative Methods 375	4
Quantitative Methods 370	4
	<hr/>
	16

Third Quarter

	<i>Hours</i>
Accounting 102	3
Finance 340	4
Quantitative Methods 272	4
Behavioral science	4
Physical education	1
	<hr/>
	16

Senior Year

First Quarter

Humanities	4
Management 359	4
Quantitative Methods 371	4
Quantitative Methods 376	4
	<hr/>
	16

Second Quarter

Business Law 310	4
History or political science	4
Humanities	4
Elective ^b	4
	<hr/>
	16

Third Quarter

Humanities	4
History or political science	4
Marketing 360	4
Elective ^b	4
	<hr/>
	16

^aIt is recommended that Mathematics 195 be taken in preparation for Quantitative Methods 375; Mathematics 370, in preparation for Mathematics 375.

^bThe following are recommended electives for quantitative methods majors:

1. Quantitative Methods 370—Dynamic Programming
Economics 335—Econometrics
2. Mathematics 280—Problem Oriented Languages
Mathematics 281—Assembly Language Programming
3. Mathematics 220—Elementary Differential Equations I
Mathematics 321—Elementary Differential Equations II
Mathematics 322—Elementary Partial Differential Equations I
4. Mathematics 310—Higher Analysis I
Mathematics 311—Higher Analysis II
Mathematics 312—Higher Analysis III
5. Mathematics 340—Modern Higher Algebra I
Mathematics 341—Modern Higher Algebra II
Mathematics 342—Modern Higher Algebra III

The prerequisites and electives stated in (a) and (b) above may be used to satisfy the 13-hour general education requirement.

The College of Education

Van Cleve Morris, Ed.D., Dean of the College
George C. Giles, Jr., Ph.D., Associate Dean
Emanuel Hurwitz, Ph.D., Assistant Dean
Joseph J. Malinchoc, Ed.D., Director of Student Teaching
Charles A. Martin, Ph.D., Director of Elementary Education
Daniel Powell, M.A., Coordinator of Secondary Education

Professors: Jean H. Baer, Ph.D.; Robert M. Crane, Ed.D.; Andrew M. Greeley, Ph.D.; David M. Jackson, Ph.D.; Van Cleve Morris, Ed.D.; David A. Page, M.A.; Victor E. Ricks, Ph.D.

Associate Professors: Armin Beck, Ph.D.; Patricia A. Charlier, Ph.D.; Ricardo F. D'Amare, Ph.D. (Visiting); George C. Giles, Jr., Ph.D.; Eliezer Krumbein, Ph.D.; Joséph J. Malinchoc, Ed.D.; Julius Menacker, Ed.D.; George E. Monroe, Ph.D.; Elizabeth C. Porch, Ed.D.; Daniel Powell, M.A.; Robert Rippey, Ph.D.; Madelaine Shalabi, Ph.D.; Harriet Talmage, Ph.D.; Charles A. Tesconi, Ed.D.; Judith V. Torney, Ph.D.; Herbert J. Walberg, Ph.D.; Edward Wynne, Ph.D.

Assistant Professors: Robert R. Blake, Ph.D.; Joseph L. Braga, Ed.D.; Rheta DeVries, Ph.D.; Frederick D. Erickson, Ph.D.; Robert B. Grant, Ph.D.; Anne M. Heinz, Ph.D.; Helen E. Hughes, Ph.D.; Emanuel Hurwitz, Ph.D.; Carolyn Leonard, M.A.; Charles E. Mader, Ed.D.; Charles A. Martin, Ph.D.; Donald R. Moore, Ed.D.; Dorothy Olsen, M.A.; Robert H. Ratcliffe, Ph.D.; Tanis H. Schwartz, Ph.D.; William A. Silverman, J.D.; Aimee W. Strawn, M.Ed.; Roland W. Swaim, Ed.D.; Philip W. Tiemann, Ph.D.; Donald R. Warren, Ph.D.; Iva Wells, M.A.; Thomas A. Wilson, Ed.D.

Instructors: Ann G. Adams, M.A.; Therese L. Baker, B.A.; Frances F. Brown, M.A.; Carmen A. Carsello, M.A.; Langston L. Coleman, M.S.T.; Grace E. DeGirolamo, M.Ed.; Catherine Fishel, M.A.; Jesse Garcia, M.Ed.; Gloria S. Gibbs, M.Ed.; Marie L. Johnson, M.S.; Anna M. Larson, M.Ed.; Susan Levy, M.S.; Sheila McKenzie, B.A.; Dolores I. Taylor, M.Ed.; Antonio A. Valcarcel, B.A.; Ward W. Weldon, M.A.; Carlton I. Williams, M.Ed.; David A. Wilson, M.S.

Lecturers: Tomas Rabell-Ramos, B.A. (Visiting)

Assistants: Michael Barnett; Helen S. Brown, B.A.; Jacqueline R. Brown, B.A.; Willene Davis, B.S.; Lorraine Gutsche, B.A.; William McCready, M.A.; Sandra R. Mueller, A.B.; Orville Naylor, B.A.; Gregory Rudolph, M.A.; Susan M. Stier, B.A.; Matthew War Bonnet; Rafaela Weffer, M.S.; Marc Weiss, B.A.; Patrice Williamson, B.A.; Stephen Wilson, M.Ed.

Student Teaching Supervisors:

Secondary. *Art*: Leon Bellin, M.A.; *Biology*: James A. Bond, Ph.D., Marlene F. Rust, M.A.; *Chemistry*: Frances Seabright, M.S.; *Earth Sciences*: Norman D. Smith, Ph.D.; *English*: Margaret M. Angoli, M.A., Lester G. Golub, Ph.D., Elaine Grauer, M.A., Gladys Knott, M.A.; *French*: Dorothy G. Barber, M.A., Carrie D. Moore, M.A.; *Geography*: Mildred Finney, Ph.D., Burton A. Kessler, M.S., Walter Waht, M.A.; *German*: Daniel G. Harrington, Ph.D.; *History*: Thomas Askew, Ph.D., Gerald A. Danzer, Ph.D., Philip H. Dreyer, M.A., William A. Peters, M.A., Andrew K. Prinz, Ph.D.; *Latin*: Dwora Gilula, M.A.; *Mathematics*: Winifred Berglund, M.A., Julia B. Linn, M.S., Kenneth H. Murphy, M.S., Grace M. Nolan, M.A., Helen W. Sears, M.A., Rose L. Vedral, M.A., Robert Zimmerman, M.S.; *Physical Education for Men*: Benedict Montcalm, M.S., Thomas E. Sattler, M.S.; *Physical Education for Women*: Marion Kneer, Ed.S.; *Physics*: Edward B. McNeil, Ph.D.; *Political Science*: Anne Heinz, M.A.; *Sociology*: James Ross, M.A.; *Spanish*: Violet Bergquist, M.A., Ramona Spinka, M.A.; *Speech*: Judith O'Malley, M.A.

Elementary: Frances Brown, M.A.; Catherine Fishel, M.A.; Gloria S. Gibbs, M.Ed.; Dorothy Olsen, M.A.; Aimee W. Strawn, M.Ed.; Dolores I. Taylor, M.Ed.; Carlton I. Williams, M.Ed.

Special Education. Ann G. Adams, M.A.; Grace E. DeGirolamo, M.Ed.; Robert B. Grant, Ph.D.; Tanis H. Schwartz, Ph.D.

Established to provide professional study in education, the College offers the professional courses for students preparing to teach in the elementary and secondary schools, with unique opportunities for students who plan to teach in urban schools. Courses in general education and in the areas of specialization for students preparing to teach in secondary schools are administered by and taught in the various departments of the colleges. Students preparing to teach physical education enter the School of Physical Education, and those preparing to teach in the secondary schools enter the College of Liberal Arts and Sciences. See *Requirements for Admission to Undergraduate Study*. The curricula for the preparation of elementary, special education, and secondary school teachers as listed in this Catalog have been approved by the University, the Illinois State Certification Board, and the National Council for the Accreditation of Teacher Education.

Emphasis on Urban Education

Situated as it is in the center of a great metropolis, the College is ideally suited to educate teachers for urban schools. Cooperative programs with the Chicago Public Schools and nearby suburban schools afford excellent opportunities for useful laboratory experiences and research. The College supports appropriate community projects and welcomes community cooperation for improvement of teacher education.

Special and Experimental Programs

The College of Education offers these special and experimental programs:

The Cooperative Program in Urban Teacher Education—This experimental program was developed to explore new ways to prepare teachers for modern metropolitan educational situations. The Cooperative Program in Urban Teacher Education (CPUTE) strives to involve teachers, parents, education students, community representatives, and pupils in an active assault upon the problems of the city schools. Learning centers are set up in cooperating elementary schools where University students and city teachers work as equal partners in the study and evaluation of classroom practices. Students learn how to function effectively within an institution while developing their role as agents of change.

Enrollment in the elementary education curriculum is the only entrance requirement for the Cooperative Program in Urban Teacher Education. Interested students should contact the Program Director in the College of Education.

The ASPIRA Project—Designed to train University of Illinois Puerto Rican students as elementary school teachers to serve in predominantly Spanish areas within the city of Chicago, the ASPIRA program is the first program in the nation that is federally funded to prepare teachers to work with bilingual students.

Students are eligible to enroll in the ASPIRA program after they have completed two years of college; the program leads to a B.A. in elementary education. Student selection for the 1971-1972 academic year has already been completed.

The Special Education Program—The College of Education offers programs that prepare teachers of emotionally disturbed children, children with learning disabilities, and mentally retarded children. These three sequences of courses comprise the College of Education Program in Special Education. Enrollment in this program leads to a B.A. and eligibility to apply for State and City of Chicago certification in the elementary grades as well as for certification as a teacher of exceptional children. Students enroll in the Special Education Program at the beginning of their junior year. Applications may be obtained in the College of Education office. Selection of students for the program is made by the special education faculty.

Teacher Corps Program—The College of Education, in conjunction with the Chicago Public Schools, offers a two-year, teacher education program designed to provide bilingual and bicultural training for teaching predominantly Mexican-American children in Chicago. Students interested in enrolling in the Teacher Corps Program should have a minimum of 90 quarter hours. Approval by a selection panel composed of College, school-system, and community members is necessary for entrance into the program.

The Council on Teacher Education

The University Council on Teacher Education is responsible for coordinating teacher education programs throughout the University and for maintaining relationships with the Chicago and the State of Illinois certification authorities. On recommendation by the University to the State Teachers Certification Board, graduates of teacher education curricula are eligible for certification in Illinois outside of Chicago. Graduates generally qualify for certification in other states and are generally eligible to take the examination for Chicago also. To be eligible for graduation and recommendation for certification a student must be enrolled in an approved program in teacher education. Graduates of curricula approved by the Council on Teacher Education are eligible for admission to the graduate college of most institutions that offer majors in the student's first or second field of specialization or in the professional areas of education.

Admission Requirements

An application for admission to a teacher education curriculum must meet the admission requirements of the college offering the chosen curriculum. A student who is transferring to a teacher education curriculum of the University of Illinois at Chicago Circle from another curriculum, college, or institution and who has completed 90 quarter hours of credit must present a cumulative grade-point average of 3.500 or more, based on a 5.000 system, for admission in good standing. Those whose cumulative averages are less than 3.300 are not ordinarily admitted to teacher education curricula. However, a recently initiated experimental program does permit the admission to the College of Education a few students with cumulative averages of less than 3.300, and such students are encouraged to apply for admission to College programs for the preparation of elementary and special education teachers.

Advising Program

Each student will be assigned an adviser in his first field of specialization; for example, if he plans to teach English, he will have an adviser in the English Department who will guide him in his selection of courses preparatory to the teaching of English and to eligibility for certification. Elementary education students will be advised by the faculty and staff of the College of Education.

Students who desire to enter a teaching curriculum or desire to change from one teacher education curriculum to another should consult with the dean or director of the college in which the curriculum is administered.

Advanced Standing Requirements

Continuation in teacher education curricula beyond the sophomore year is contingent on admission to advanced standing in teacher education, determined after the completion of 75 to 90 quarter hours of course work. The decision is based on the applicant's academic, personal, physical, and verbal and written communication qualifications.

Student Teaching

A professional quarter of student teaching (including a seminar) is required in the senior year. A student in teacher education completes Education 170, 210, 230 or 235, and 250 in sequence prior to student teaching. Student teaching is offered during the fall, winter, and spring quarters of the academic year. It is recommended that student teaching be completed during the next to the last quarter of the student's program; however, where this involves the summer quarter, student teaching is to be completed during the terminal quarter.

Applications for Student Teaching must be made during the first three weeks of the winter quarter preceding the academic year in which student teaching is contemplated; students enrolled in fall or winter quarter education classes are informed during this period about the procedure to be followed. Students not enrolled in fall or winter quarter education classes may obtain information and application forms from the Office of the Director of either Elementary or Secondary Education Student Teaching, as appropriate.

As a general rule, a student is admitted to student teaching only if he has been admitted to advanced standing in teacher education. Unless there has been deterioration in his academic or personal qualifications since he was admitted to advanced standing, a student is usually eligible for such admission. A candidate for a degree in teacher education and for eligibility for certification must complete student teaching while he is enrolled in the University of Illinois at Chicago Circle.

Student-teaching assignments will be in the Chicago and suburban public and nonpublic schools. For most students, an additional personal expense of approximately \$75 (transportation, lunches, and incidentals) also will be incurred during the quarter in which student teaching is scheduled.

Curriculum Preparatory to Teaching in Elementary Schools

For the degree of Bachelor of Arts in Elementary Education, a minimum of 180 hours, exclusive of physical education and basic military science, is required. The 180 hours should be distributed as follows:

<i>Language Arts and Humanities</i>	24 hours
Rhetoric 101, 102—Freshman and Composition	8
English ¹ or language ² and humanities	8
Education 221—Children's Literature	4
Speech 171—Principles of Speech Development and Correction	4
<i>Science</i>	27
Biological sciences (with laboratory)	12
Health science	3
Physical science (with laboratory)	12
<i>Social Science</i>	40
Geography (world regional, advanced regional)	8
American history	12
Sociology	8
Political Science 151—American Government: Organization and Powers	4
Psychology	8
<i>Fine Arts</i>	8
Art 204—Art for Elementary Teachers: Studies in Creativity	4
Music 250 ³ —Music for Elementary Teachers	4
<i>Mathematics</i>	12
Mathematics 106, 107, 108—Mathematics for Elementary Teachers	12
<i>Physical Education</i>	3
Physical Education for Women 220, 221—Elementary School	
Games and Self-testing Activities; Rhythmic Activities	4
Required physical education	6 quarters
<i>Education</i>	36
Education 170, 210, 235, 245, 250, 261, 270	36
<i>Areas of Concentration⁴</i>	12-18
Mathematics—Science	51
39 hours listed above and 12 hours credit in one subject, such as mathematics or biological science	
Foreign Language	12
Advanced hours (12) in a foreign language beyond the 106 course meet the requirements.	

¹ Satisfies the general education requirement in humanities.

² An 8-hour sequence in the literature of one foreign language at the 200 level.

³ A proficiency examination in Music 100 (prerequisite for Music 250) is given by the Department of Music in the fourth week of each quarter. Arrangements for this test are made with the department office.

⁴ Students who wish to work in an area of concentration other than those listed may petition the College of Education for permission.

Social Science	52
40 hours listed above and 12 hours in advanced courses in one field—psychology, sociology, history, philosophy, political science, geography.	
Language Arts	36-42
24 hours listed above and 18 advanced hours or 12 advanced hours in one area of language arts (except English).	
Electives	5-17

Curricula Preparatory to Teaching in Secondary Schools

Each student seeking a degree and certification for teaching at the secondary level may have *two* teaching specializations. The curricula in teacher education provide for the adequate development of the major field of specialization; the minor specialization if required for graduation should be selected from the following teacher education list of major fields of specialization. If the student needs assistance in the selection of a program for the teacher education minor, he should consult the adviser for the major.

The following table lists the fields of specialization in which degrees are granted and the total number of hours required for each.

Fields of Specialization

Total hours required are exclusive of basic military science and required physical education.

Field	Degree Awarded	General Education	Major	Minor	Educa- tion	Elec- tives	Total
Art	B.A.	52	50	—	28	15	209†
Biology	B.S.	40-52	48	33	28	0-14	195
Chemistry	B.S.	40-64	48	30-36	28	0-23	190
English	B.A.	52-76	52	32	28	0-18	180
French	B.A.	52	39	30	28	25-31	180
Geography	B.S.	40-64	48	35	28	10-34	180
German	B.A.	52	45	30	28	17-23	180
History	B.A.	52-76	48	30	28	0-22	180
Mathematics	B.S.	52-76	55	30	28	5-19	184
*Physical Education	B.S.						
Men		56	73		28	0-36	203
Women		69	63-69		28	29-36	195-196
Physics	B.S.	37	47	31	28	0-4	184
Political Science	B.A.	52-72	48	30	28	2-22	180
Sociology	B.A.	52-76	48	32	28	0-22	180
Spanish	B.A.	52	49	30	28	28-34	180
Speech	B.A.	52-76	48	30	28	0-22	180

*Physical Education is administered by the School of Physical Education.

†Total hours include 45 hours in the foundation program. Art is administered by the Department of Art.

Illinois State Teachers Certification Requirements **Minimum Academic Requirements for State Certificates**

Effective September 1, 1967

The following table does not apply to applicants who are graduates of Illinois Approved Entitlement Programs or out-of-state recommended NCATE programs. This table is a guide only for prospective students. University of Illinois at Chicago Circle programs fulfill all of the requirements detailed below.

Required Credits in Semester Hours

Type of Certificate	Standard Elementary I	Standard High School II	Standard Special III	Junior College IV	Special V	Provisional VI
Grades certificate is valid for	Kinder- garten through 9	6 through 12	Kinder- garten through 14	13 14	11 12 ^p	Kinder- garten through 12
Life of Certificate	4 years	4 years	4 years			2 years ^q
Degree required	B.A. or B.S.	B.A. or B.S.	B.A. or B.S.	B.A. or M.S.	B.A. or B.S.	B.A. or B.S.
General Education	78	42	42			
1. Language arts	8 ^b	8	8			
2. Science	6 ^b					
3. Mathematics	4 ^b	6 ^r	6 ^r			
4. Social science*	6 ^b	6	6			
5. Humanities	6 ^{a, b}	6	6			
6. Health and physical education	3	3	3			
7. Additional work in any of above fields and/or psychology (except educa- tional psychology)						
for a total of	78	42	42			
Professional Education	16	16	16			
1. Educational psychology**	2	2	2			
2. Methods and techniques of teaching	2 ^c	2 ^k	2			
3. History and/or philosophy of education	2	2	2			

Continued

4. Methods of teaching reading	2	5 ^b	5 ^t	
5. Student teaching	5 ^d			
6. Electives in professional education for a total of	16 ^e	16 ^f	16	
Areas of Specialization [†]			32 ^m	36 ⁿ
1. One major area of specialization (16 hrs) or		32		
2. Three minor areas of specialization (18-20-24 hrs each)		48-72		
Electives	26	0-30	30	
Total	120	120	120	120

* Including a course in American history and/or government.

** Including human growth and development.

† Note: Courses offered in fulfillment of the general education requirement may also be offered as part of the hours required for the area(s) of specialization.

a Including a minimum of 1 semester hour in music and 1 semester hour in art.

b Each field (except physical education) must have a minimum of 1 additional hour, which may be in content and/or methods.

c At the elementary level.

d Grades Kindergarten-9. Those who have had 5 semester hours of student teaching above grade 9 and who have had successful teaching experience are not required to take another student teaching course at the elementary level.

e May be taken from the fields listed and/or guidance, tests and measurements, and instructional materials.

f Science and/or mathematics.

g At the secondary level or in a teaching field.

h Grades 6-12. Those who have had 5 semester hours of student teaching below grade 6 and who have had successful teaching experience are not required to take another student teaching course at the secondary level.

i Above plus methods of teaching reading.

j A Special Certificate in guidance will be issued to an applicant who has the required 32 semester hours in guidance and possesses a Standard Elementary. High School Certificate or another Special Certificate or a Supervisory Certificate.

k In each teaching field named in the certificate.

l Entitled to teach not more than 10 hours per week in elective subjects, providing the county superintendent of schools, having supervision of the district, certifies that no regularly-certified teacher is available.

m May be renewed at the end of each 2-year period upon evidence that 8 semester hours of credit have been earned within the period, provided the requirement for the certificate of the same type issued for the teaching position for which the teacher is employed shall be met by the end of the second renewal period.

n Certificate expires June 30th following date of issue but may be renewed annually if holder earns 5 semester hours of credit approved by the Superintendent of Public Instruction in consultation with the State Teacher Certification Board.

o Must have at least a major and a minor in separate subject fields.

p In area of specialization. Those who have had 5 semester hours of student teaching experience need not take student teaching in the field of specialization.

The following rules are used in evaluating transcripts of applicants for certificates:

1. If a proficiency test is shown specifically on an official transcript(s), it may be substituted for the required semester hours of mathematics. Four years of high school mathematics may also be offered in lieu of this requirement if they are listed specifically on the official transcript. One semester hour of credit may be given for each year of high school credit in foreign languages for a total not to exceed 4 semester hours if such credit is listed on the transcript.
2. Language arts include composition, rhetoric, grammar, oral and written expression, literature, dramatics, journalism, speech, reading, spelling, and penmanship or their equivalents in integrated courses.
3. Social science must include a course in American history and/or government. Additional courses will be accepted from history, political science, sociology, economics, geography (except physical geography), and general social science or their equivalents in integrated courses.
4. "Humanities" covers courses in art, music, philosophy, foreign language, literature, and 3 hours of religion or the equivalents in integrated courses.
5. "Health and physical education" covers hygiene, health education, safety, driver education, physical education, and recreation or their equivalents in integrated courses.
6. Integrated courses providing experiences in two or more areas and in quantity comparable to suggested minimums may be approved as shown on transcript(s) or by a registrar's letter.

In addition to certificates in categories I—VI listed in the above table, the Certification Board offers other provisional, supervisory, and administrative certificates to qualified applicants. The substitute Certificate requires (1) another valid certificate, (2) a bachelor's degree, or (3) two years teaching experience and evidence of a minimum of 60 semester hours of college credit, including 6 semester hours in professional education.

The above information on academic requirements for Illinois State Certificates is excerpted from the Office of the Superintendent of Public Instruction, Bulletin #70-01-125, dated September 1, 1967, of the Illinois State Teacher Certification Board. For additional information or clarification of any of the above, consult the Illinois State Teacher Certification Board.

Minimum Academic Requirements for a Temporary Certificate for Teaching in the Chicago Public Schools

Elementary

1. Bachelor's degree based on four years of training in a fully accredited college.
2. Fifteen semester hours in elementary education.
 - A. For grades 3 to 8:
Methods courses in at least two of the following must be included—arithmetic, language arts, science, and social studies.
 - B. For kindergarten through primary grades:
At least two of the following—kindergarten methods, beginning reading, early childhood education.

High School

1. Bachelor's degree based on 4 years of training in a fully accredited college.
2. Eighteen semester hours in education, distributed according to the following mini-

imum semester credit hours are required for high school and grades 7 through 12 teacher examinations:

	<i>Hours</i>
A. American public education	2
B. Principles or philosophy of education	2
C. Adolescent or educational psychology	2
D. Methods of teaching in the secondary schools	2
*E. Student teaching in grades 7 through 12	5
F. Electives in professional education	0.5
	<hr/>
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Note: These requirements meet minimum standards of the State Office of Public Instruction and the North Central Association. Catalog descriptions will be consulted for consideration of equivalent courses with varying titles.

Minimum subject-matter requirements for high school.

- A. Twenty semester hours in the following subject areas:
Accounting, art, business training, foreign languages, mathematics, music, physical education, stenography.
- B. Twenty-four semester hours in the following subject areas:
Biology, chemistry, drafting, English, general science, geography, history, home-making arts, industrial education, physics.
- C. Eighteen semester hours in library science.

Note: For specific distribution of hours in courses within each subject area consult the Board of Examiners, Chicago Public Schools.

Trade and Vocational

1. Five years of full-time employment in the trade of the certificate or three years of full-time employment in the trade of the certificate and a bachelor's degree from a fully accredited college.
2. Current approval of the State Board of Vocational Education.

Evening Schools: Same requirements as for teachers in the day schools.

The above information was excerpted from a bulletin of the Chicago Board of Education, Board of Examiners. All temporary certificates expire June 30th of the current school year. For any additional information or clarification of any of the above, consult the Chicago Board of Education.

*One year of successful teaching in grades 7 through 12 in an accredited school may be substituted for student teaching.

The College of Engineering

George Bugliarello, Sc.D., Dean of the College

Herbert J. Stein, Ph.D., Associate Dean

David W. Levinson, Ph.D., Director of Industrial Liaison

William DeFotis, M.S., Assistant Dean

Henry A. Setton, M.I.E., Assistant Dean

H. Dale Walraven, M.A., Assistant Dean

The College of Engineering prepares young men and women for one or more of the many career opportunities in the engineering profession, such as those in design, production, research, development, management, and construction. An engineering education also prepares a student for work in medicine, law, public administration, and other areas.

Instruction in the College is complemented by intensive research activity by most of the faculty. Research is directed toward supporting the educational programs of the College, solving contemporary technological problems, and extending the frontiers of scientific knowledge. This continuing research activity helps to insure the integrity and progressive evolution of instructional programs at all levels. In conjunction with their teaching and research, many of the faculty also engage in public service activities in the community and in government on the state and federal levels.

The Departments of the College of Engineering

The administrative structure of the College is organized according to the basic, functional engineering areas of *energy, information, materials, and systems*. The faculty are grouped in departments corresponding to these areas and in a program in bioengineering. Within this framework, many instructional and research activities are cross-departmental. Moreover, the faculty in each department may cover several disciplines.

This functional arrangement broadens the educational scope of the College and encourages interdisciplinary and innovative programs. Its faculty are presently engaged in teaching and research activities pertinent to almost all fields of the engineering profession, including the following: aerospace science, applied mechanics, applied physics, bioengineering, chemical engineering, communications engineering, computer science, energy

conversion, industrial engineering, manufacturing engineering, mechanical analysis and design, metallurgy, operations research, soil engineering, structural design, structural mechanics, systems analysis, thermomechanical engineering, transportation systems engineering, urban systems engineering, water and air resources, wave propagation and radiation.

The Faculty of the College of Engineering

The Bioengineering Program

Professors: James W. Dow, M.D.

Associate Professors: Earl E. Gose, Ph.D.; B. L. Zuber, Ph.D.

Assistant Professors: Jeffrey Levett, Ph.D.

Assistants: Hsiang Chou; John J. Napolilli, B.S.; William T. Schipper, B.S.

Lecturers: Stuart G. Abrams, M.S.; Lester P. Lakowski, M.S.

The Department of Energy Engineering

Professors: James P. Hartnett, Ph.D., Head of the Department; Paul M. Chung, Ph.D.; Norman A. Parker, M.S.M.E.; Satish C. Saxena, Ph.D.

Associate Professors: Lyndon R. Babcock, Ph.D.; John C. Cutting, Ph.D.; Joseph C.F. Chow, Ph.D.; David S. Hacker, Ph.D.; John H. Kiefer, Ph.D.; Wolodymyr J. Minkowycz, Ph.D.; Edward S. Pierson, Sc.D.; Harold A. Simon, Ph.D.; Stephen Szepe, Ph.D.

Assistant Professors: Aemer D. Anderson, Ph.D.; Allen C. Cogley, Ph.D.; John C. Cutting, Ph.D.; G. Ali Mansoori, Ph.D.; Kenneth L. Uherka, Ph.D.; Calvin J. Wolf, Ph.D.

Assistants: James B. Alwin, B.S.; William M. Bishop, M.S.; Michael A. Brown, B.S.; Ronald J. Bywater, M.S.; Samuel Hong-Ping Chen, B.S.; Henry M. Domanus, M.S.; John A. Dudek, B.S.; Narasimham A. Ganti, M.S.; Barry L. Gilbert, B.S.; Pericles S. Koronakis, M.S.; Shih-Chang Lin, M.S.; Thomas J. Marcisz, M.S.; David M. McQueen, M.S.; Huseyin Ozcan, M.S.; Laird P. Roth, M.S.; Ho-Tien Shu, M.S.; Kunihisa Soda, M.S.; Pugalur Sudhindra, M.S.; Sang-Sin Yoo, M.S.; Eugene Y.J. Yuh, M.S.; Shu-Chien Yung, M.S.

The Department of Information Engineering

Professors: Leon H. Fisher, Ph.D., Head of the Department; James W. Dow, M.D.; Philip Parzen, Ph.D.

Associate Professors: Robert C. Arzbaecher, Ph.D.; Kurt Burian, Ph.D.; Earl E. Gose, Ph.D.; Chu-Quon Lee, Ph.D.; Chathilingath K. Sanathanan, Ph.D.; Henry A. Setton, M.I.E.; Herbert J. Stein, Ph.D.; Piergiorgio L.E. Uslenghi, Ph.D.; Bert L. Zuber, Ph.D.

Assistant Professors: Yun-Leei Chiou, Ph.D.; Roger C. Conant, Ph.D.; Rucelle L. Consigny III, Ph.D.; William A. DeFotis, M.S.; John D. Ferguson, Ph.D.; Hitoshi Inada, Ph.D.; Sharadbabu R. Laxpati, Ph.D.; Jeffrey Levett, Ph.D.; Tadao Murata, Ph.D.; Miljenko Orsic, Ph.D.; Roland Priemer, Ph.D.; Howard Prosser, Ph.D.; Thomas M. Smith, M.S.; Stephen Tsai, Ph.D.

Instructors: Robert A. Dell, Jr., M.S.; Philip L. Katz, M.S.

Assistants: Jonas Butvila, B.S.; Paul Chan, B.S.; Chi-Fa A. Chuang, B.S.; Rukes I. Gattia, B.S.; Frederick J. Gunther, B.S.; Jin-Sung Hsia, B.S.; Yiin-ming Jong, B.S.; Mark C.C. Kao, B.S.; Larry W. Kirsch, B.S.; Kristin T. Kocan, B.S.; Frank P. Konieczny, B.S.; Lakhamichand N. Lalwani, B.S.; Steven W. Landauer, B.S.; Helen S. Poon, B.S.; Roger W. Schalk, B.S.; Shu-Ho Yung, B.S.

The Department of Materials Engineering

Professors: Ernest F. Masur, Ph.D., Head of the Department; Thomas H. Blewitt, Sc.D.; David W. Levinson, Ph.D.; William Rostoker, Ph.D.; John A. Schey, Ph.D.; Thomas C.T. Ting, Ph.D.

Associate Professors: Robert F. Domagala, M.S.; James M. Doyle, Ph.D.; Gordon H. Geiger, Ph.D.; Roy B. Perkins, M.S.; Daniel F. Schoeberle, Ph.D.; Albert B. Schultz, Ph.D.; Surendra P. Shah, Ph.D.; Otto E. Widera, Ph.D.; Chien-Heng Wu, Ph.D.

Assistant Professors: Ted B. Belytschko, Ph.D.; Graham M. Brown, Ph.D.; Robert H. Bryant, Ph.D.; Sushil Chandra, Ph.D. (Visiting); Yao W. Chang, Ph.D.; Donald G. Lemke, Ph.D.; Charles A. Moore, Ph.D.; Thomas M. Mulcahy, Ph.D.; Marshall L. Silver, Ph.D.; Michael J. Weins, Ph.D.

Assistants: Philip H. Abramowitz, M.S.; Olimpio F. Angeles, Jr., M.S.; Evangelos P. Dimopoulos, B.S.; Ronald P. Dudek, B.S.; Lawrence W. Glaum, B.S.; George K. Haritos, B.S.; Nancy A. Holmes, M.S.; Bang-Jean Hsieh, B.S.; John E. Karlovsky, B.S.; Ronald F. Kulak, M.S.; James C. LaBelle, B.S.; Jaw S. Lan, M.S.; Shing-Shong Lan, B.S.; William T.C. Li, M.S.; Lai-chih Lo, M.S.; Joseph A. Lobo, M.S.; Anal J. Mehta, M.S.; Rangaswamy G. Palaniswamy, M.S.; Robert E. Russell, B.S.; Muthkrishnan G. Srinivasan, M.S.; Manuel C. Tan, B.S.; Ralph L. Tobler, B.S.; Wilfredo V. Venal, M.S.; Ignacio S. Wu, B.S.

Research Associates: Daniel Y.P. Perng, Ph.D.

Lecturers: Clyde N. Baker, M.S.; Paul E. Mast, Ph.D.; Charles A. Timko, Ph.D.; Peter Turula, Ph.D.; Adolf Walser, M.S.

The Department of Systems Engineering

Professors: Joseph H. Engel, Ph.D., Head of the Department; George Bugliarello, Sc.D.; Samuel E. Shapiro, B.S.; Edwin Thomas, Ph.D.; H. Dale Walraven, M.A.

Associate Professors: Gyan C. Agarwal, Ph.D.; Richard C. Kohler, Ed.D.; William D. O'Neill, Ph.D.; Fred W. Schroeder, M.A.

Assistant Professors: Edward J. Caldario, M.S.; M.V.J. Dembski, M.A.; Floyd G. Miller, Ph.D.; Francis A. Mosillo, M.A., Assistant Acting Head of the Department; Nancy L. Nihan, Ph.D.; Edward W. Walbridge, Ph.D.

Instructors: Deepak Dammi, M.S.; Ronald Lodewyck, M.S.; Robert Pancner, B.S.

Visiting Lecturers: Yehuda Gur, Ph.D.

Graduate Assistants: Lawrence Cecchini, B.S.; Moolaipeedikail Chacko, B.S.; Nicholas Jermihov, B.S.; Lakhamichand Lawlani, B.S.; Hanna Lubbat, M.S.; Niva Oghigian, B.S.; Kivanc Oregil, B.S.

Emeriti of the College

Professors: Clarence I. Carlson, B.S., General Engineering; Arnold C. Cobb, M.S., Thermodynamics; Henry L. Garabedian, Ph.D., Mathematics and Energy Engineering; Frederick W. Trezise, M.A., Engineering Science, Associate Dean of the College.

Associate Professors: Leon N. Blair, B.S., General Engineering; Edward H. Coe, C.E., Civil Engineering; Dee M. Holladay, B.S., General Engineering.

Assistant Professors: Truman C. Buss, B.S., General Engineering; Richard S. Royster, M.A., General Engineering.

Undergraduate Study in Engineering

The function of the engineer, both in industry and in government, is becoming increasingly broad; problems must be solved and advice must be given that covers a diffuse, and often seemingly unrelated, area of specialization. Moreover, within the context of modern demands the traditional engineering classifications have lost much of their relevance.

In recognition of this trend, and in an effort to anticipate future developments, the College of Engineering and several other colleges in innovative American universities offer the general degree of Bachelor of Science in Engineering. In designating only one all-encompassing degree, the College also gives recognition to one of its principal educational philosophies, namely, to allow the student the maximum possible freedom in organizing his educational program to suit his specific needs and interests.

Some course programs are considered indispensable to any engineering curriculum and are therefore mandatory for all engineering students. They include, first of all, approximately one-half year of work in the general fields of the *humanities and social sciences*. Because the engineer is no longer a narrow professional specialist, he can no longer afford to ignore the effect of his work on the general welfare of society. The humanities-social sciences phase of his education helps him orient himself toward becoming a conscious contributor to the general welfare.

All engineering areas require certain basic tools; therefore the *Common Core Curriculum* which supplies them to all engineering students is the second phase of the engineering curriculum. This mandatory Common Core Curriculum, comprising slightly more than two years of work, includes instruction in mathematics and the physical sciences (physics and chemistry) and an introduction to the basic engineering sciences, such as mechanics, materials, thermodynamics, electronics and circuits, and systems analysis. Also included in this mandatory portion of the curriculum is an introduction to "design," which represents the first exposure of the student to his ultimate engineering function of making choices among alternatives.

A package of slightly less than one year of elective work in an *area of concentration* follows. This package usually represents the technical phase of the student's interest and is formulated, by him and his adviser, to constitute a cohesive program that best suits the student's needs and aspirations.

The curriculum is completed with 25 hours of *free electives* that are often predominantly technical; however, they may also be nontechnical, particularly if the student elects to pursue a possible career in which his services will be broadly based and society oriented.

The Common Core Curriculum

Required of all students in engineering, the 113-hour Common Core Curriculum consists primarily of courses of study common to all branches and specializations of engineering—those in mathematics, physics, chemistry, and the engineering sciences.

The first four quarters of the Common Core Curriculum consist of the following courses:

First Year

First Quarter

Mathematics 130—Analytic Geometry	5
Systems Engineering 151—Introduction to Engineering Design I	4
Chemistry 112—Chemical Bonding and Structure	5
Rhetoric 101—Freshman Rhetoric and Composition	4
Physical Education	(1)

Second Quarter

Mathematics 131—Calculus I	5
Systems Engineering 152—Introduction to Engineering Design II	4
Chemistry 113—Equilibria: Chemistry of Solutions	5
Rhetoric 102—Freshman Rhetoric and Composition	4
Physical Education	(1)

Third Quarter

Mathematics 132—Calculus II	5
Systems Engineering 153—Introduction to Engineering Design III	4
Physics 111—General Physics I (Mechanics)	4
Materials Engineering 142—Properties of Materials I	4
Physical Education	(1)

Second Year*First Quarter*

Mathematics 133—Calculus III	5
Materials Engineering 101—Engineering Mechanics I	3
Mathematics 195—Introduction to Automatic Digital Computing	3
Physics 112—General Physics II (Mechanics, Thermodynamics)	5
Physical Education	(1)

Additional Common Core Curriculum Courses

The specific order in which these courses are taken will depend on the elective work the student has chosen in an area of concentration. In any case, the student should complete the Core Curriculum by the end of his junior year.

	Hours
Energy Engineering 201—Thermodynamics II	4
Energy Engineering 211—Fluid Mechanics	4
Information Engineering 210—Introduction to Circuit Analysis	5
Information Engineering 219—Introduction to Electromagnetic Fields	4
Information Engineering 240—Introduction to Electronics	4
Materials Engineering 102—Engineering Mechanics II	3
Materials Engineering 103—Engineering Mechanics III	3
Materials Engineering 230—Properties of Materials II	4
Mathematics 220—Elementary Differential Equations I	3
Physics 113—General Physics III (Electricity and Magnetism)	5
Physics 114—General Physics IV (Wave Phenomena and Relativity)	5

Area of Concentration Electives

In addition to other degree requirements, each student must complete approximately 36 quarter hours of elective work in an area of concentration. This group of elective courses is tailored to the individual student's abilities and professional interests.

Shortly after the student enrolls in the College, he is assigned a faculty adviser. Before he completes the Common Core Curriculum, he will be required, in consultation with his adviser, to formulate a cohesive package of appropriate courses. As an aid to the student, several such course packages have been assembled; they have proved attractive in the past and may be useful as guides. However, the student has complete flexibility in designing a totally individualized program so long as it is approved by the appropriate curriculum committees in the College. Hence, it is easily possible for the student to prepare himself for any of the multitude of post-baccalaureate opportunities that are available.

Humanities and Social Sciences

To satisfy the degree requirements in the College of Engineering, a student must complete 24 quarter hours in courses in the humanities and the social sciences. He must complete a sequence of at least 8 quarter hours in the humanities and a sequence of at least 8 quarter hours in the social sciences. The additional courses required to complete the 24 quarter-hour College requirement may be taken in either the humanities or the social sciences.

Sequences and courses recommended by the College follow: in addition, the student has the option, in consultation with his adviser, to develop an individualized program of sequences and courses in the humanities and the social sciences that includes courses not on this list. In general, any course numbered *above* the courses on the list may be taken for credit provided the student satisfies the prerequisites for the course and it is in the humanities or the social sciences.

Courses in accounting, industrial management, finance, personnel administration, introductory language (see *Free Electives* for an explanation of foreign language credit) and ROTC are *not* humanities courses and *cannot* be used to satisfy the humanities and social sciences requirements. However, such courses may be taken as free electives.

Humanities and Social Sciences Sequences

Humanities

Classics 104, 211
History of Architecture and
Art 115, 142, 143, 144
English 101, 102, 103
English 131
English 150, 151, 152
French 104, 105, 106
German 104, 105, 106
History 110, 111, 112, 113
History 131, 132, 133
History 241, 242, 243
Humanities 101, 102, 103
Humanities 151, 152, 153

Information Engineering 201
Latin 104, 105, 106
Music 130, 131
Philosophy 101, 102, 103
Philosophy 150
Philosophy 222
Russian 104, 105, 106
Spanish 104, 105, 106
Speech and Theater 121, 122, 123

Social Sciences

Anthropology 130, 150, 160
 Criminal Justice 101, 251
 Economics 120, 121
 Economics 324
 Geography 104, 105
 Geography 363
 Geography 371

History 151, 152, 153
 Political Science 150, 151
 Political Science 318, 319
 Psychology 100, 115, 130
 Sociology 100, 130, 131
 Speech 111, 112, 113

Free Electives

The engineering program also allots a block of 25 quarter hours to free-elective courses that may be both technical and nontechnical, and the student is expected to maintain a reasonable balance between them. Free electives are also selected in conference with the adviser. Students in the ROTC program are allowed 5 hours of credit if they complete the entire four-year program.

As noted, introductory language courses (101, 102, 103) do not satisfy the 8-hour humanities requirement. However, if the adviser consents, they may be taken for free-elective credit under the following provisions: If the student continues a language begun in high school, credit is determined on the basis of both placement test results and the amount of high school work completed—

If he presents two years of high school credit, he receives credit for a 101 course provided he places in a 101 course.

If he presents three years of high school credit, he receives credit for the course in which he places provided it is not below the 102 level.

If he presents four years of high school credit, he receives credit for the course in which he places provided it is not below the 104 level.

Graduation Requirements

The Bachelor of Science in Engineering is awarded upon the completion of 198 quarter hours of credit, exclusive of physical education. These hours (discussed in detail elsewhere in this section) include 113 quarter hours in the Core Curriculum; approximately 36 hours in electives in the area of concentration; 24 hours in the humanities and the social sciences; and 25 hours in free electives. In addition, all of the general University requirements for graduation must be met. See *General University Requirements*.

College Graduation Honors

Students are awarded College Honors at graduation for academic distinction. Such honors are designated on the diploma as Honors, High Honors or Highest Honors.

Honors are awarded to a student who earns at least a 4.0 cumulative grade-point average; High Honors are awarded to a student who earns at least a 4.3 grade-point average; Highest Honors are awarded to a student who earns

at least a 4.7 grade-point average. All transfer work is included in the determination of grade-point averages. *Excluded* are the grades from required physical education courses and military science courses.

Admission to the College of Engineering

For details of entrance requirements and dates for filing an application for admission to the University, see page 40 of this catalog.

Transfer Students

The College of Engineering admits qualified transfer students from other institutions. The prospective transfer student whose courses most nearly parallel the offerings at Chicago Circle in content and credit hours effects the transfer most easily. To the extent possible, a transfer student from a two-year community college should concentrate on the following course work before he transfers into the College of Engineering.

1. Rhetoric and composition
2. Chemistry
3. Physics for engineers (with calculus as a prerequisite)
4. Mathematics through differential equations

The Mathematics and Chemistry Placement Tests

A new student who enters the College of Engineering must take the Mathematics Placement Test unless he has completed college-level work in algebra or trigonometry with a grade of D or above. Transfer students who present such college-level credit are required to take the Mathematics Placement Test at the discretion of the Dean of the College of Engineering.

Students who present high school credit in chemistry must take the Chemistry Placement Test. Students with one year of high school chemistry and adequate preparation, as shown by the placement examination, take Chemistry 112. Students who have not had high school chemistry take Chemistry 111. Students do not receive credit toward graduation in the College of Engineering for courses below Chemistry 112 and Mathematics 130.

The Cooperative Engineering Education Program

Effective in the fall of 1971, the College of Engineering will offer a cooperative education program, which is a coordinated program of alternating work and study that provides an opportunity for the undergraduate engineering student not only to acquire academic knowledge in engineering but also to obtain practical experience in the field. To enter the cooperative education program, the student must have attained junior standing and must have met other academic criteria. Further information on the program is available from the College Office.



The College of Liberal Arts and Sciences

Dean B. Doner, Ph.D., Dean of the College
Robert E. Corley, Ph.D., Associate Dean
Robert L. Hess, Ph.D., Associate Dean
Ellis B. Little, Ed.D., Associate Dean
Wade A. Freeman, Ph.D., Assistant Dean
Edward P. Friedman, Ph.D., Assistant Dean
Allen H. Howard, Ph.D., Assistant Dean
Vivian C. Lipman, Ph.D., Assistant Dean
Patricia A. McFate, Ph.D., Assistant Dean

The College of Liberal Arts and Sciences supports and promotes the traditions of liberal scholarship and studies in its academic program; it also offers programs of professional and preprofessional education and service courses for the other colleges at Chicago Circle.

Curricula Offered by the College

The College curricula permit students to broaden their knowledge through general education and through concentration within an academic discipline or a specialized program.

Until students declare a field of specialization (the major) or are accepted into a specialized program, they remain within the general curriculum of the College, with opportunities for academic advising by the College Office, which provides information about University and College degree requirements and advises students in selecting a field of specialization (the major).

Arts and Sciences Curricula

These curricula lead to the degree of *Bachelor of Arts in Liberal Arts and Sciences* or the degree of *Bachelor of Science in Liberal Arts and Sciences*. Students choose a field of specialization, (a major) from the following academic disciplines:

Anthropology	Geography	Physics*
Biological Sciences	Geological Sciences	Political Science
Chemistry*	German	Psychology*
Classics	History	Slavic Languages and Literatures
Economics	Mathematics	Sociology
English	Music	Spanish
French	Philosophy	Speech

*More than one degree program is offered in this field; consult the department listing for details.

Specialized Curricula

The degree of Bachelor of Arts or Bachelor of Science is offered *in the field of specialization*:

Administration of Criminal Justice
Chemistry*
Mathematics and Computer Science
Physics*
Teacher Education

*These curricula provide more specialized training in chemistry and physics than do the arts and sciences curricula in these fields.

Teacher Education Curricula

Students who are preparing for certification in secondary schools may enroll in curricula supervised by the departments offering the various majors. These programs, which differ in some respects from those of the arts and sciences curricula, lead to a baccalaureate that qualifies the student to teach one of the following subjects in a secondary school:

Biological Sciences	Geography	Political Science
Chemistry	German	Russian
Earth Sciences	History	Sociology
English	Mathematics	Spanish
French	Physics	Speech

To register in a teacher education curriculum a student must have a minimum grade-point average of 3.500 at the end of his sophomore year.¹ The teacher education student must meet all University and College requirements for graduation. Specific requirements for teacher education majors and minors are listed under the departments.² In addition to these requirements, all students in all teacher education curricula must complete Psychology 100, Political Science 151, and Education 170, 210, 230, 250, and 270. Students may also meet certification requirements by taking the appropriate education courses and sufficient work in a field of specialization.³

Preprofessional Curricula

The preprofessional curricula provide course work for students who intend to pursue their undergraduate or graduate training in a professional school. Prelaw and premedicine students may earn a degree in the College of Liberal Arts and Sciences. Other preprofessional programs lead to a degree awarded not by the College of Liberal Arts and Sciences but by the appropriate professional college. Therefore, it is important that the student familiarize himself with the specific requirements of the professional school. Students may register for preprofessional work in one of the following areas:

Medical dietetics	Prelaw ⁴
Medical record administration	Premedicine ⁵
Medical technology	Prenursing
Occupational therapy	Prepharmacy
Predentistry	Preveterinary medicine

¹Students whose minimum grade-point average is below 3.500 should consult the Dean of the College of Education.

²If he so wishes, the student may choose, in consultation with his departmental adviser, a minor field. However, the Department of Political Science, requires all students who major in Teacher Education in Political Science to choose an approved teaching minor.

³See Certification Requirements for Teachers, Illinois State.

⁴The College of Law of the University of Illinois (at Urbana) requires a degree from an approved undergraduate college; this requirement may be waived by special action. For further information, consult the Office of the Dean of the College of Law at Urbana. Some colleges of law admit students who have completed three years of college work. Prelaw students should consult the office of the dean of law of the college in which enrollment is contemplated for further information about admissions policies.

⁵The premedicine curriculum is a four-year program leading to a bachelor's degree. Students who enroll in this program choose a field of specialization and complete the usual graduation requirements of the College of Liberal Arts and Sciences.

Graduation Requirements

The University requires that the student complete at least 186 quarter hours of credit for the bachelor's degree, including Rhetoric 101 and 102 (or the equivalent) and six quarter hours of credit in physical education (unless exempted). The College of Liberal Arts and Sciences requires a minimum of 180 quarter hours applicable to the degree, either the first 135 or the last 45 quarter hours of which must be earned in uninterrupted residence at Chicago Circle.⁶ Credit earned through proficiency examinations may not be applied toward the minimum 45 quarter-hour residence requirement.⁷ Study abroad and study off campus that have been approved by the student's major department and by the College are not considered an interruption of residence for students in the College of Liberal Arts and Sciences.

A student is responsible for meeting the respective graduation requirements in effect at the time of his initial registration in each of the following: The University of Illinois at Chicago Circle, the College of Liberal Arts and Sciences, and the arts and sciences curricula or the specialized curricula or the preprofessional curricula. If a graduation requirement is changed, the student may elect to continue under the requirement in effect at the time of his initial registration or he may elect to fulfill the subsequent requirement for graduation. If courses originally required are no longer offered, the College has the prerogative of specifying acceptable substitutes.

The College of Liberal Arts and Sciences has additional requirements for graduation in the areas of foreign language; in course distribution requirements in the humanities, the social sciences, and the natural sciences; and in the field of specialization (the major).

Foreign Language Requirement. The basic requirement is a reading knowledge of any recognized language at a level of proficiency equivalent to that which would result from 24 quarter hours of language study at the University of Illinois at Chicago Circle.⁸ The requirement may be fulfilled by presenting four years of high school credit in a single foreign language, by completing a full sequence of language courses (see *Courses of Instruction* for the offerings of the language departments), by taking a partial sequence determined by the results of a placement test, or by passing a proficiency examination written by arrangement with the appropriate language department. Students whose performance on the placement test indicates assignment to a more advanced course than would normally be expected may receive some college credit. If a language is not currently offered at Chicago Circle, the College will make special arrangements for an examination. The following rules apply to the foreign language requirement for graduation for those students who have not presented four years of high school credit in a single foreign language:

⁶Work taken at the University of Illinois at Urbana-Champaign does not satisfy this requirement.

⁷See *Proficiency Examinations*.

⁸Transfer students with credit for two years of language study satisfy the College language requirement.

1. For the student who wishes to satisfy the language requirement by continuing to study a language begun in high school⁹, the results of the placement test will determine the level at which he will continue his language study on the college level. For example, the student who places in the equivalent of a 101 course will enroll in that course but will receive credit for it only if he presents *no more than two years* of high school credit in that language; the student who places in the equivalent of a 102 course will enroll in that course but will receive credit for it only if he presents *no more than three years* of high school credit in that language. A student who wishes to repeat an introductory language course taken elsewhere (for which he will not receive credit) may register for such a course only with the consent of both the particular language department and an assistant dean in the College Office.
2. A transfer student with some language study who has not yet completed the language requirement *must* take a placement test if he plans to continue study in that language. If the placement test so indicates, he may register for a course that duplicates previous college credit; in that case, by University rule, the previous credit is forfeited.
3. The student who begins his language study at Chicago Circle and the student who transfers to the University with fewer than 45 quarter hours of credit should complete the foreign language requirement by the end of the junior year. The transfer student admitted with 45 or more quarter hours of credit registers for a foreign language course every quarter until he has satisfied the language requirement. If a transfer student is admitted with 135 quarter hours but has not had a previous opportunity to meet the language requirement and would be unable to complete it before his graduation, he satisfies the requirement by passing a course in the same language during each quarter he is in residence.

Course Distribution Requirements introduce the student to three areas of knowledge—the humanities, the social sciences, and the natural sciences. In the College of Liberal Arts and Sciences the student must have 12 quarter hours of credit in humanities, 12 in social sciences, and 20 in natural sciences. Although some departments offer course work that satisfies the requirement in more than one area, a student may use course work in a given department to fulfill the requirement in only one of the three areas. A maximum of 12 hours in the student's major department applies toward course-distribution credit. Transfer students will receive course-distribution credit for equivalent courses taken elsewhere.* If a transfer student has not completed the equivalent of all the College's course-distribution requirements elsewhere, he is required to fulfill the remainder at Chicago Circle.

*Transfer students with an associate in arts degree in a baccalaureate-preparatory curriculum from a Class A junior college will be given credit for at least 8 quarter hours in each of the three areas for work actually completed.

⁹These students should continue their study without a time lapse.

A wide variety of courses in the College of Liberal Arts and Sciences carry course-distribution credit for students in the College; some courses in the College of Architecture and Art and in the College of Business Administration also carry course-distribution credit for students in the College of Liberal Arts and Sciences. The following table indicates the courses that carry course-distribution credit for College of Liberal Arts and Sciences students.

**Courses that Meet the
Course-distribution Requirements
In Humanities, Social Sciences, and Natural Sciences*
(Effective September, 1970)**

Humanities—12 quarter hours

Classics:

In Translation: All courses.

Greek: All courses beyond the 100 level.

Hebrew: All courses beyond the 100 level.

Latin: All courses beyond the 100 level.

English: All 100-level courses and 273, 274, and 287.

French: 185; all 200-level courses except 209-213, 281, 282; all 300-level courses.

German: All 100-level courses except 100-115, 121-126; all 200-level courses except 201-207, 230, 240, 250, 251, 298, 299; all 300-level courses except 320, 321, 385.

History: All courses except 151, 251-253, 351-354, 386, 388, 389.

History of Architecture and Art: All 100-level courses; all 200-level courses.

Humanities: All courses.

Music: 100, 130, 131; 215-220, 230-232, 288, 289; 330.

Philosophy: All courses except 200; no more than one course in logic may be offered.

Slavic Languages and Literatures:

Polish: All courses above the 100 level.

Russian: All courses above the 100 level except 207 and 332.

Spanish, Italian, and Portuguese:

Italian: All courses except 101-103.

Portuguese: All courses except 101-103.

Spanish: All courses except 101-103.

Speech and Theatre: 121-123, 141; 241; 321, 322, 324, 325, 328, 329.

Social Sciences—12 quarter hours

Anthropology: All courses.

Criminal Justice: All courses.

Economics: All courses.

Geography: 110-169, 190, 197; 210-269.

History: 151; 251-253; 351-354, 386, 388, 389.

Political Science: All 100-level courses; all 200-level courses except 250, 251, 299.

Psychology: All courses.

Sociology: All 100-level courses except 185; all 200-level courses except 262, 263, 287, 288, 299.

Speech and Theatre: 100-102, 107, 111-113, 131, 171, 180, 181; 201, 202, 211-213, 231-233, 239; 301-303, 311-313, 315, 331, 333, 334, 351.

Natural Sciences—20 quarter hours

Biological Sciences: All courses.

Chemistry: All courses except 110, 111, 132.

Geography: For students enrolled in the University prior to September 1970: 101-103.
No other courses.

Geology: All courses.

Mathematics: All courses. except 100, 101, 104-108, 170-172.

Natural Sciences: 121-124.

Physical Sciences: All courses.

Physics: All courses.

*Any combination of courses in any one of the three areas will satisfy the requirement. Course numbers refer to course listings in this Catalog; the college will give credit for equivalent courses. All course prerequisites must be met. Courses used to fulfill the language requirement may not also be offered to meet the course-distribution requirement. James Scholars may apply any 100-level or 200-level honors course credit, including independent study, for course-distribution credit in addition to the courses in this table.

Field of Specialization (the Major).

The student may, in some instances, select a field of specialization (his major) upon admission to the University or at any time during his freshman year. However, all students in the College must, if they have not already done so, declare a major when they have earned 67 quarter hours of credit. Some departments may not accept a student as a major until he has completed a minimum number of credit hours in department courses.

Requirements for the majors are stated in the department listings. At least 20 quarter hours of the major requirements must be taken in upper-division courses; 12 of these quarter hours must be taken while the student is in residence. The department may not require a student in an arts and sciences curriculum to take more than 60 quarter hours of course work in his major department. Some departments require up to 55 quarter hours of prerequisite and collateral work*; however, the total field of specialization, including department and additional collateral hours, may not exceed 108 quarter hours.

*Collateral work in a field of specialization is defined as those required courses outside the major department that are designated by area or by specific course number.

A student may declare a second field of specialization (double major) by indicating this intention to his adviser in the primary field of specialization. He would then pursue course work for each of his fields according to the requirements of each department. Cross-listed courses may serve both fields. A student need not repeat work or duplicate requirements to complete the second field of specialization.

The Minor

Students who entered the College or declared a field of specialization after September 1, 1969, are not required to elect a minor; however, a student who so desires may graduate with a minor field of specialization not to exceed 32 quarter hours, of which at least 12 must be at the 200 or 300 level, *except in a foreign language*, where 8 quarter hours must be at the 200 or 300 level. Requirements for the minor are stated in the department listings. When a student elects a minor field of specialization, the program of study in that field must be developed with and approved by an adviser in the department of the minor field of specialization. Work in the minor may be taken in one department only. The department in which the student chooses a minor field may specify that at least 8 advanced hours must be taken in residence.

For students who entered the College before September 1, 1969, and/or declared a major prior to that date, the residence rule for the minor is as follows:

1. At least 8 quarter hours of the minor must be taken in residence unless the major department waives the residence requirement.
2. If the minor is a split minor, at least 4 quarter hours in each field must be taken in residence unless the major department waives the residence requirement.

The Related Field

Although the College does not require work in a related field for graduation, some departments do include a related-field requirement in their degree programs. Some also offer the student the option of taking a related field (see department listings). When a related field is required:

1. It must consist of at least 22 quarter hours of work.
2. It may not exceed 32 hours of work.
3. With the exception of work in foreign languages, where 8 quarter hours are sufficient, department requirements in a related field must include at least 12 quarter hours of work in upper-division courses.
4. At least 8 quarter hours of the related field must be taken in residence unless the major department waives the residence requirement.

Graduation With Honors

To be eligible to graduate with *General College Honors* a student must meet one of the following conditions:

1. A minimum grade-point average of 4.500 for the last two years (at least 72 quarter hours) in all academic work completed at the University of Illinois at Chicago Circle and counted toward the degree.
2. For students whose work has been *entirely* in residence at Chicago Circle, a minimum grade-point average of at least 4.000 in all work completed and counted toward the degree.
3. For students whose work has not been taken entirely in residence, a 4.000 average in all academic work completed at the University of Illinois at Chicago Circle (at least 45 quarter hours) and counted toward the degree, *and* a 4.000 combined average for all academic work counted toward the degree, both at the University of Illinois at Chicago Circle and elsewhere.

See the department listings for the requirements for graduation with *Departmental Honors* (Departmental Distinction).

The Dean's List

A student's superior academic achievement in the College of Liberal Arts and Sciences is recognized by his being named to the Dean's List. Nomination is based on a 4.5 quarter-by-quarter average with a 12 quarter-hour minimum load (exclusive of basic military science and physical education) 8 quarter hours of which must be for letter grades and a grade of *pass* for any course taken on a *pass-fail* basis.

Dropping a Course

A student may drop a course as late as the last day of the ninth week of the quarter.

Certification of Irregular Students

Upon request, the Dean of the College will issue a letter of certification to an irregular student* who has completed departmental requirements for a major in the College. The letter of certification, issued in lieu of a second bachelor's degree, states that the student has fulfilled all course requirements for a major in a particular department.

*An irregular student is one who holds a bachelor's degree from a recognized institution of higher learning.

Student Options

The College offers a range of opportunities for students to pursue individualized courses of study:

Independent Study. A number of departments offer courses titled *Independent Study* or *Independent Research* in which the student may pursue his own special interests. He may offer toward the degree as many as 32 quarter hours of credit in independent-study courses.

Credit for Courses Taken Outside the College. Except for those students who are majoring or minoring in economics, the student may offer for graduation credit as many as 48 quarter hours in courses not covered by liberal arts and sciences curricula in the University or elsewhere; the student majoring or minoring in economics may offer as many as 48 quarter hours of such courses, in addition to economics courses. The first 12 quarter hours of such work must be approved by the College Office and the balance, up to the 48 quarter-hour maximum, by the student's major department. Required education courses in the teacher education curricula, however, do not need special approval.

Education Courses. A student who is not in a teacher education curriculum may apply credit earned in education courses toward the degree*.

Graduate Courses. A student may enroll in a course in the Graduate College (400-level) for undergraduate credit with the permission of the appropriate department.

*Only students enrolled in the College of Education or in teacher education curricula, however, may enroll in Education 270 (Educational Practice).

Pass-Fail Grade Option. A system of pass-fail grading for the College of Liberal Arts and Sciences was approved for a trial period of four years beginning with the fall quarter, 1969, in the hope that students would be encouraged to explore areas of interest which they might otherwise avoid because of the possibility of low grades, and in anticipation that some of the anxieties of adjustment and grade competition would be reduced.

A summary of regulations that apply to the pass-fail grade option follows.

1. Any full-time student in good standing may elect the pass-fail option. In this instance, a full-time student is defined as one who completes the quarter in which he elects the option with 12 academic quarter hours. A student is in good standing if he is not on probation. A student on undetermined status must request permission from an assistant dean of the College to elect the pass-fail option.
2. Any course in the College of Liberal Arts and Sciences, including those in rhetoric and those courses meeting requirements for course distributions but excluding those courses designated by name or area that major departments require for satisfying the major, may be chosen under the pass-fail option.

3. A maximum of 12 courses counted toward a degree may be taken under the pass-fail option. No more than one course per quarter may be taken under the pass-fail option.
4. When he registers, the student will notify the College Office of his intention to enroll in a course under the pass-fail option and the College Office will determine whether he qualifies for the option. A change between the letter-grade option and the pass-fail option may be made by the student within the first two weeks of the quarter. If a student elects to take a course on the pass-fail option or wishes to change his election (or a combination of both) he must complete the Pass-Fail Option Card available in the College Office.

Students who register late or whose courses are changed by a requirement of the College will be allowed to elect or drop the pass-fail option at the discretion of the Dean of the College.

5. In cases of multiple registrations, each registration counts. Multiple registrations apply either to different sections of the same course, each of which bears credit, or to more than one registration in a course that may be repeated for credit.
6. No more than two courses, including cross-listed courses, may be taken in one department under the pass-fail option.
7. Grades of D or better will be considered passing, i.e., the pass grade (P) will replace the letter grades A, B, C, and D; the fail (F) will replace the letter grade E. Grades of Df or In will be replaced by P or F, upon completion of the course work.
8. Instructors will not be informed as to which students have elected the pass-fail option. The Office of Admissions and Records will convert the instructor's letter grade to P or F.
9. If a student changes his major to a department that requires a course that he has previously taken under the pass-fail option, the student's grades for all such courses are converted from P or F to the original letter grade reported to the Office of Admissions and Records and are counted in the computation of the grade-point average. Should the student change his major again, the letter grades will remain—they will not be reconverted to the pass or fail designation.
10. A student registered in a college other than Liberal Arts and Sciences may not elect the pass-fail option for a course in the College unless his own college offers such an option.
11. A Liberal Arts and Sciences student registered in a course offered by another college may not use the pass-fail option in that course unless that college also offers the pass-fail option.

Proficiency Examinations. A student may take, at no charge, proficiency examinations for credit in languages and in any subjects that are not offered at Chicago Circle but are offered at another campus of the University of Illinois; for information, contact the Office of the College of Liberal Arts and Sciences at Chicago Circle. A student may take a proficiency examination in any subject offered in the College of Liberal Arts and Sciences, provided he meets the eligibility requirements published in this Catalog.

The Administration of Criminal Justice

Stephen A. Schiller, J.D., Director of the Curriculum

Professors: Arthur J. Bilek, M.S.W.; Dragomir Davidovic, LL.D. (Visiting); Joseph D. Nicol, M.S.; James W. Osterburg, M.P.A.

Associate Professors: James T. Carey, Ph.D.; Donald McIntyre, LL.B.; Stephen A. Schiller, J.D.; John A. Webster, D. Crim.

Assistant Professors: Harry W. Schloetter, M.S.W.; Larry L. Tifft, Ph.D.

The degree of Bachelor of Arts is awarded to students who fulfill the general University and College of Liberal Arts and Sciences graduation requirements, and successfully complete the Curriculum in the Administration of Criminal Justice.

The curriculum provides an academic and philosophical approach to the study of criminal justice and law enforcement by critically examining and interrelating material from sociology, political science, history, public administration, philosophy, and psychology.

The program is designed for students planning a career or graduate study in law enforcement, police administration, criminal law, corrections, criminalistics, probation and parole, criminology, or delinquency. Undergraduates and persons presently working in police and correction agencies may enroll.

Major—43 hours, distributed as follows:

Sociology 100

Psychology 100

Criminal Justice, 101, 102, 351, 352, 353

16 hours of criminal justice courses, chosen with the consent of the adviser, at the 200 and 300 level.

Required Prerequisite and Collateral Courses—32 hours distributed as follows:

Criminal Justice 231

Sociology 131, 225, 276

Political Science 150, 151, 205

Minor—A student majoring in an area other than the administration of criminal justice who feels that a *minor in criminal justice* would broaden his understanding of criminal law and its operation in our society must take 27 hours, of which 19 must be at the 200 and 300 level, distributed as follows:

Criminal Justice 101, 102, 351, 352, 353

8 additional hours of courses in criminal justice at the 200 and 300 level, chosen with the consent of his adviser.

Anthropology

Robert L. Hall, Ph.D., Chairman of the Department

Professors: Laura A. Bohannon, Ph.D.; Charles A. Reed, Ph.D.

Associate Professors: Susan T. Freeman, Ph.D.; Robert L. Hall, Ph.D.; Jack H. Prost, Ph.D.

Assistant Professors: Elizabeth A. Brandt, Ph.D.; Merwyn S. Garbarino, Ph.D.; McGuire Gibson, Ph.D.; Paul E. Hockings, Ph.D.; James L. Phillips, Ph.D.; Stephen L. Schensul, Ph.D.; Sylvia J. Vatuk, Ph.D.; Charles P. Warren, Ph.D.

Instructors: Waud H. Kracke, M.A.; Emile M. Schepers, M.A.

Major—for the degree of Bachelor of Arts, 52 hours, distributed as follows:

Anthropology 130, 150, 160, 200, 213, 231, 245, 280, and 20 hours of courses in anthropology at the 200 level or above.

A major interested in a subdivision of anthropology (social, physical, archeological, or linguistic) must arrange a suitable program of electives with his adviser. Each major is assigned a departmental adviser.

Departmental Distinction: A candidate must be eligible for College Honors, meet all the requirements for a major in anthropology, and satisfactorily complete a thesis in Anthropology 299. A student who elects a minor in anthropology may also, with the consent of the department, be awarded distinction upon satisfactory completion of Anthropology 299.

Minor—Students from other departments who wish to minor in anthropology must take Anthropology 130, 150, 160, and 20 hours of courses in anthropology at the 200 level or above, chosen in consultation with an adviser assigned by the Department of Anthropology.

Biological Sciences

Professors: Elmer B. Hadley, Ph.D., Acting Head of the Department; Donald A. Eggert, Ph.D.; Sidney F. Glassman, Ph.D.; Bernard Greenberg, Ph.D.; Helene N. Guttman, Ph.D.; Marion T. Hall, Ph.D. (Adjunct); Robert F. Inger, Ph.D. (Adjunct); Ellis B. Little, Ed.D.; Kenneth M. Madison, Ph.D.; Albert S. Rouffa, Ph.D.; William Sangster, Ph.D.; Max Shank, Ph.D.; Stanley K. Shapiro, Ph.D.; Rolf Singer, Ph.D. (Visiting); Eliot B. Spiess, Ph.D.

Associate Professors: Louise E. Anderson, Ph.D.; David Bardack, Ph.D.; Howard E. Buhse, Ph.D.; M.A.Q. Khan, Ph.D.; David B. Mertz, Ph.D.; Darrel L. Murray, Ph.D.; John A. Nicolette, Ph.D.; Halina J. Presley, Ph.D.; Jack H. Prost, Ph.D.; David Shomay, Ph.D.; Charles N. Spirakis, Ph.D.; Thomas N. Taylor, Ph.D.; Robert B. Willey, Ph.D.

Assistant Professors: James A. Bond, Ph.D.; Satish Chandran, Ph.D.; Shepley S.C. Chen, Ph.D.; Michael R. Cummings, Ph.D.; Merrill Gassman, Ph.D.; Manuel Goldman, Ph.D.; David G. Penney, Ph.D.; Thomas W. Seale, Ph.D.; A. Spencer Tomb, Ph.D.; Phebe Van Valen, Ph.D.; Ruth L. Willey, Ph.D.

Instructors: Elizabeth B. Deis, M.S.; James F. Janicke, M.S.; Marlen Rust, M.A.; Paul J. Taxey, M.A.; Kirk L. Whiteside, M.S.; Mohammed Younus, M.A.

Lecturers: Syed Hasan Abid, M.S.

Research Associates: Joan M. Hewlett, Ph.D.; Nancy K. Hutson, M.S.

Assistants: Arif Bin Ali, B.S.; Noreen O. Ash, B.S.; Jared L. Beard, B.S.; Irene A. Blekys, B.S.; Sheila Brack, M.S.; Anita C. Bukowiecki, B.A.; Diane Chambliss, B.A.; Lin-Li Judy Chang, B.S.; Sun-Jin Choih, M.S.; Andrea L. Christenson, B.S.; Ralph H. Cornell, B.S.; Halina Dowhoshya, B.S.; Elisa M. Durban, B.A.; Lawrence J. Dziedzic, B.S.; Harold Eiler, B.S.; David G. Ford, M.S.; Patricia G. Frank, B.A.; Linda K. Gallo, B.A.; Emily W. Goldberg, B.S.; Kenneth R. Groh, M.S.; Barbara Haux, D.D.S.; Arthur F. Hirsch, B.S.; Elizabeth R. Holcomb, B.S.; James R. Jennings, B.S.; Charmayne A. Jesik, M.A.; Ahmad Kamal, M.S.; Eric E. Karrfalt, M.S.; Charles Kroon, B.S.; Wayne A. Landerholm, B.S.; Richard L. Libanoff, B.S.; Roger D. Maina, B.A., B.S.; Rosemary A. Marone, B.S.; Michael A. Millay, M.S.; Leilani H. Miller, B.A.; Joel J. Mintzes, B.S.; Bishnupriya Misra, B.S.; Marsha Newman, B.S.; Randy L. Pachnik, B.S.; Charles Passo, B.S.; Sharon M. Pendola, B.S.; Frances Pivorunas, B.S.; Robert B. Rosen, B.S.; Gar W. Rothwell, M.S.; Martin N. Sachman, B.S.; Mariam Sanati, B.S.; Richard N. Sherwin, M.S.; Edward M. Smith, B.S.; Michael D. Spektor, B.S.; Susan J. Stamler, B.S.; Anatol J. Stankevych, B.S.; June Steinberg, B.S.; Ruth C. Styskal, B.S.; Lawrence Sykora, B.S.; Irene Tang, M.A.; Marian L. Wilson, M.S.; Tina H. Yacher, B.S.

Major—for the degree of Bachelor of Science, 42 hours (including Biological Sciences 100, 101, and 102), distributed as follows:

Biological Sciences 240, 261, 300, 315, 324 or 380, 345

One from 230, 232, 280, 313, 319, 333, 384, 388, 389

In addition, courses at the 200 level or above, chosen with the consent of an adviser, to bring the total to 42 hours in biological sciences.

Mathematics 100, 101 and 130 or 104, 105, and 130.

(Mathematics 104, 105, and 130 are recommended for Biological Sciences 240 and are required for Biological Sciences 343, 344.)

Required Prerequisite and Collateral Courses

Chemistry 111 (if needed), 112, 113, 114, 233, 234 (Chemistry 235 is highly recommended.)

Physics 101, 102, 103; or 111, 112, 113

Departmental Distinction: A candidate must perform creditably in Biological Sciences 299, Individual Topics, and must pass an examination administered by the department.

Minor—Students from other departments who wish to minor in biological sciences must take Biological Sciences 100, 101, 102, and 20 hours of courses in biological sciences at the 200 level or above, chosen in consultation with an adviser in the Department of Biological Sciences.

Teacher Education in Biological Sciences: Requirements for Teaching in Secondary Schools

Major—46 hours, distributed as follows:

Biological Sciences 100, 101, 102

240, 261

300, 307, 315, 324 or 380, 345

One course from 230, 232, 280, 313, 319, 333, 384, 388, 389

Physics 101, 102, 103 or 111, 112, 113

Chemistry 111 (if needed), 112, 113, 114, 233, 234

Three quarters of mathematics

(Calculus and/or statistics is highly recommended.)

Electives: 6 to 8 hours in biological sciences

(To provide a balance between plant and animal biology.)

Minor—33 hours, distributed as follows:

Biological Sciences 100, 101, 102

21 hours from 200 and 300-level biological sciences courses

Chemistry

Professors: William F. Sager, Ph.D., Head of the Department; Bernard J. Babler, Ph.D., Executive Secretary; Joseph H. Boyer, Ph.D.; Thomas H. Brown, Ph.D.; Richard L. Carlin, Ph.D.; Ferris B. Crum, Ph.D. (Emeritus); Roy Huitema, Ph.D. (Emeritus); Charles K. Hunt, Ph.D.; Chui Fan Liu, Ph.D.; Clifford N. Matthews, Ph.D.; Robert M. Moriarty, Ph.D.; Jan Rocek, Ph.D.; Robert I. Walter, Ph.D.

Associate Professors: Ronald J. Baumgarten, Ph.D.; Richard P. Burns, Ph.D.; Jacques Kagan, Ph.D.; John H. Kiefer, Ph.D.; Hans T. Mueller, Ph.D. (Emeritus); Victor J. Mansfield, Ph.D.; Samuel Schrage, Ph.D.

Assistant Professors: Benedict W. Bangerter, Ph.D.; Sheila Cohen, Ph.D.; John W. Cowin, M.S. (Emeritus); Wade A. Freeman, Ph.D.; Eric A. Gislason, Ph.D.; David George Gorenstein, Ph.D.; Anatol Gottlieb, T.Sc.D.; Cynthia A. Jameson, Ph.D.; Richard J. Kassner, Ph.D.; Rosalind A. Klaas, Ph.D.; Florence C. Klee, Ph.D.; Leonard Kotin, Ph.D.; Harvey Z. Kriloff, Ph.D.; Thomas A. Lothian, Ph.D.; James N. McElearney, Ph.D.; Gerard J. Mikol, Ph.D.; Robert D. Minard, Ph.D.; Edward G. Rietz, Ph.D.; George I. Sackheim, M.S.; Robert N. Schwartz, Ph.D.; John F. Steiner, Ph.D.; Milton Yusem, Ph.D.; Robert F. Zahrobsky, Ph.D.

Instructors: Doris C. Blumenthal, M.S.; Shafeek Farag, M.A.; James K. Luurs, M.S.; Ralph E. Meints, Ph.D.; Clarence J. Perry, M.Ed.; Eva Rocek, Ph.D.; Edward S. Sachs, M.S.; Michael G. Savoy, M.S.; Frances K. Seabright, M.S.; John E. Spikner, M.S.; Myo K. Yoo, M.S.

Assistants: Dalmacio A. Agdeppa, Jr., M.S.; Mir Amir Ali, M.S.; David E. Aylward, M.S.; Alan I. Attia, M.S.; Dorothy C. Barron, M.S.; Paula Berghorn, B.S.; Howard L. Blaz, B.S.; Frank E. Budenholzer, B.S.; Yue-guey L. Chang, M.S.; Kan-nan Chen, B.S.; Tajan Chiang, B.S.; Chun C. Chien, M.S.; Craig M. Connally, B.S.; Phillip DeChristopher, M.S.; Johannes DeJong, Ph.D.; Wesley L. Doak, B.A.; Joseph C. Drozd, M.S.; Jonathan E. Dunn, B.S.; Gary R. Dyrkacz, M.S.; Arthur F. Eidson, B.S.; Peter S. Ellis, B.S.; Paul S.

Facuna, B.S.; Bruce E. Firth, B.S.; Chia-Min Fu, M.S.; Peter Pi-Cheng Fu, M.S.; *Joel Galante, B.S.; Rita Galuszka, B.S.; Thomas J. George, M.S.; Judith M. Grobe, M.A.; David A. Harrison, M.S.; George J. Jilek III, B.S.; Andrew D. Jorgenson, B.S.; Moo Jin Jun, M.S.; Steven Fredrich Kammeyer, B.S.; Krishan L. Kalra, M.S.; Elliot Katten, B.S.; Zivile Keliuotis, B.A.; Khe Bing J. Kho, M.S.; Jose Lafita, B.A.; Sharlin Liaw, M.S.; Juo-Kwang Lin, B.S.; Boon H. Loo, M.S.; Donald B. Losee, Jr., M.S.; *Alberto M. Martinez, M.S.; Stanley Merchant, M.S.; William F. Myszkowski, M.S.; Chiu Sheung Ng, M.S.; Lydia Ng, B.S.; Wei-Yang Ni, M.S.; Jewel L. Nicholls, M.S.; *Dennis H. Patterson, M.S.; Terrence R. Pavis, B.A.; James T. Przybytek, M.S.; Cecelia A. Radlowski, B.S.; Robert W. Schwartz, B.S.; Arthur E. Siegel, M.S.; Anthony J. Spak, B.S.; *Peter Stiffel, B.S.; Emilio Sturino, B.S.; Luisito A. Tolentino, M.S.; Neil M. Tomiuk, M.S.; Ale M. Vasaitis, B.S.; Gerald C. Wagner, B.S.; Sherman S. Wang, M.S.; Alice F. Wyrwicz, B.S.; Fang-Weng Yang, B.S.; Lilly C. Yang, B.S.; William Yang, B.A.; Chin-lung Yeh, M.S.; Hsiou Y. Yu, B.S.

*Graduate Fellow

Post-Doctoral Fellows and Research Associates: Fariza Hasan, Ph.D.; Rabindranath Mukherjee, Ph.D.; V.T. Ramakrishnan, Ph.D.; Radhakrishnan Selvarajan, Ph.D.; Fred Stoos, Ph.D.

Major—for the degree of Bachelor of Arts, 55 hours, distributed as follows:

Chemistry 112, 113, 114, 121 or 117, 118, 119

233, 234, 235, 237, 282

340, 341, 342, 343, 344, 345 or

380, 382, 383 and 10 additional

hours of 300-level courses if the department recommends.

Required Prerequisite and Collateral Courses

Mathematics 104 and 105 (if needed); 130, 131, 132

Physics 111, 112, 113

Chemistry majors are assigned a departmental adviser.

See also *The Chemistry Curriculum*.

Departmental Distinction: Candidates for departmental distinction must perform creditably in all required advanced hours. For specific requirements consult the executive secretary of the department at least two quarters before graduation.

Minor—Students from other departments who wish to minor in chemistry must take 32 hours of courses, chosen with the consent of an adviser in the Department of Chemistry. The following are recommended:

15 hours in 112, 113, 114

17 additional hours at the 200 or 300 level

Teacher Education in Chemistry: Requirements for Teaching in Secondary Schools

Major—51 hours, recommended distribution is as follows:

Chemistry 112, 113, 114, 121 or
117, 118, 119
340, 341, 342, 343, 344, 345 or
380, 382, 383, and 3 hours of 300-level
courses

Supporting Courses—42 hours

Mathematics 130, 131, 132, 133; 104 and 105 if needed

Physics 111, 112, 113

Science *electives* must be chosen in consultation with the adviser.

The Chemistry Curriculum

The degree of Bachelor of Science in Chemistry is awarded students who successfully complete 192 hours, exclusive of physical education and basic military science, in this curriculum in the College of Liberal Arts and Sciences. This course of study satisfied all the requirements set by the American Chemical Society for professional accreditation.

Prerequisites for Chemistry 340 must be fulfilled before the fall quarter of the student's junior year.

Rhetoric 101, 102	8 Hours
German or Russian ¹	0-24
Humanities	12
Social Science	12
Mathematics 130, 131, 132, 133	20
Physics 111, 112, 113	14
Chemistry 117, 118, 119 or 112, 113, 114, 121 if the department recommends	
233, 234, 235, 237	15
340, 342, 344, 347	16
341, 343, 345	7
314, 315, 321	13
Advanced natural science and/or mathematics electives approved by the adviser	17
Electives	17-41

¹The equivalent of two years in a single language at the college level; French may be accepted; consult the Department of Chemistry.

Classics

Professors: Edwin B. Levine, Ph.D., Head of the Department

Associate Professors: Theodore J. Tracy, Ph.D.

Assistant Professors: Elizabeth R. Gebhard, Ph.D.

Instructors: Moshe Bernstein, M.A.; Robert J. Callahan, M.A.; George Hoffman, M.A.; Helen E. Moritz, M.A.

Visiting Lecturers: Dwora Gilula, M.A.

Assistants: Dianne M. Engram, M.A.

Major—for the degree of Bachelor of Arts, 42 hours exclusive of 100-level courses, including the following:

Specialization in Greek

Greek 201, 202, 203, 211 and 24 additional hours in Greek, chosen with the consent of the department. Greek majors who elect a minor are urged to choose Latin. These courses are recommended: Latin 101, 102, 103, 104, 105, 106.

Specialization in Latin

Latin 201, 202, 203, 204, 205, 206, 207, 211, 250, 252. Latin majors who elect a minor are urged to choose Greek. These courses are recommended: Greek 101, 102, 103, 104, 105, 106.

Majors in classics are urged to take at least one year of ancient history, with concentration on the Greek and Roman periods.

Minor—Students from other departments who wish to minor in Greek or Latin must take a total of 32 hours in either, with a minimum of 8 hours in courses at the 200 level or above. Greek or Latin courses taken in fulfillment of a general education requirement may not be used for the minor.

Economics

The degree program in economics is administered by the College of Liberal Arts and Sciences. Those listed below are members of the faculty of the College of Business Administration.

Professors: Eliezer B. Ayal, Ph.D. (Visiting); Raymond W. Coleman, Ph.D. (Emeritus); William Grampp, Ph.D.; Richard F. Kosobud, Ph.D., Coordinator of Economics; Raymond L. Richman, Ph.D.; Sherman Shapiro, Ph.D.; William W. Tongue, Ph.D.

Associate Professors: Bert E. Elwert, Ph.D.; Oscar Miller, M.A.

Assistant Professors: Robert D. Auerbach, Ph.D.; Thomas M. Johnson, J.D., Ph.D.; Mildred Levy, Ph.D.; Ronald P. Moses, Ph.D.; Arthur D. Seltzer, A.M.; Shlomo Shalit, Ph.D.; Allen Sinai, Ph.D.; Houston H. Stokes, Ph.D.

Major—for the degree of Bachelor of Arts in Liberal Arts and Sciences, 36 hours, including:

Economics 120, 121, 320, 321

Finance 340

At least 16 additional hours at the 300 level with no more than 8 from any one of these three areas:

Area 1—Economics 324, 325, 326

Area 2—Economics 333, 334, 335

Area 3—Economics 327, 328, 329, 330, 331, 332

Required Prerequisite and Collateral Courses—23 hours, including:

Mathematics 110, 111, 112

Quantitative Methods 270, 271, 272

Minor—Students from other departments who wish to minor in economics must take at least 20 hours of course work including Economics 120, Economics 121, and one or more of the following: Economics 320, Economics 321, Finance 340.

English

John C. Johnson, Ph.D., Head of the Department

Professors: Paul D. Carroll, M.A.; John A. Conley, Ph.D.; Dean B. Doner, Ph.D.; Falk S. Johnson, Ph.D.; Alexander Karanikas, Ph.D.; Bernard R. Kogan, Ph.D.; Jay A. Levine, Ph.D.; Robie M. Macauley, M.A.; Louis Marder, Ph.D.; Ralph J. Mills, Jr., Ph.D.; John F. Nims, Ph.D.; Robert B. Ogle, Ph.D.; Andrew Schiller, Ph.D.; John B. Shipley, Ph.D.; James B. Stronks, Ph.D.; Eugene B. Vest, Ph.D.; Samuel A. Weiss, Ph.D.; Martin Wine, Ph.D.; Elizabeth V. Wright, Ph.D.

Associate Professors: Irving D. Blum, Ph.D.; Beverly Fields, Ph.D.; Gloria G. Fromm, Ph.D.; Robert W. Gladish, Ph.D.; Lester S. Golub, Ph.D.; Guinevere L. Griest, Ph.D.; Moreen C. Jordan, Ph.D.; Robert J. Kispert, Ph.D.; Zelma B. Leonhard, Ph.D. (Emerita); Michael Jay Lieb, Ph.D.; W. Nell Love, Ph.D.; John H. Mackin, Ph.D.; Adam Makkai, Ph.D.; Valerie B. Makkai, Ph.D.; Patricia A. McFate, Ph.D.; A. Lavonne Ruoff, Ph.D.; Jaroslav Schejbal, Ph.D.; Mary Thale, Ph.D.; Maurita Willett, Ph.D.

Assistant Professors: Annie Aubrey, Ph.D.; Preston M. Browning, Ph.D.; Melvin H. Buxbaum, Ph.D.; Archibald J. Byrne, Ph.D.; Kathryn H. Carlson, M.A.; Nancy R. Cirillo, Ph.D.; Sarah Cohen, Ph.D.; John P. Fludas, Ph.D.; Judith K. Gardiner, Ph.D.; Edith Gold, Ph.D.; Allen D. Goldhamer, Ph.D.; Eleanor K. Harris, A.M.; Hymen H. Hart, Ph.D.; Dale S. Herron, Ph.D.; Willis C. Jackman, M.A.; Howard H. Kerr, Ph.D.; Laurette A. Kirstein, M.A.; David S. Lenfest, Ph.D.; Vincent Louthan, Ph.D.; Ronald J. McCaig, M.A.; Irving M. Miller, Ph.D.; Michael Morrisroe, Jr., Ph.D.; Margaret H. Oleksy, M.A.; Sondra Rosenberg, Ph.D.; Gene W. Ruoff, Ph.D.; James Russell, Ph.D.; Catherine M. Shaw, Ph.D.; Gerald C. Sorensen, Ph.D.; Morris Star, Ph.D.; Frederick C. Stern, Ph.D.; Dale E. Woolley, Ph.D.

Instructors: Michael A. Anania, M.A.; Michael C. Bartlett, M.A.; John B. Bell, M.A.; Janet L. Borland, M.A.; Rolf H. Charlston, M.A.; F. Gaylord Cox, M.A.; Russell E. Davis, M.A.; Aletta M. Dreller, M.A.; Mary D. Ellickson, M.A.; Bertram Enos, M.A.; Roslyn J. Friedman, M.S.; Beverly Friend, M.A.; Mary V. Gibson, M.A.; Elaine M. Grauer, M.A.; Robert C. Gruen, M.A.; Arthur L. Greenwald, M.A.; John Gubbins, M.A.; Lucy Hegie, M.A. (Emerita); Mimi S. Hall, M.A.; John R. Holt, M.A.; Judith Isaac, B.A.; John C. Jacobs, M.A.; Michael D. Johnson, M.A.; Dolores L. Keranen, M.A.; Merriion S. Kerwick, M.A. (Emerita); Gary R. Kirby, M.A.; Josephine M. Knopp, M.A.; Gladys M. Knott,

M.A.; Narvel L. Lane, M.A.; Joan C. Lawson, M.A.; James L. Lucas, M.A.; Horace C. Merten, M.A. (Emeritus); Sara C. Niederman, M.A. (Emerita); Jane D. Novak, M.A.; Nancy M. Parra, M.A.; Anne Phillips, M.S.; C. Lynn Ross, M.A.; Constantine Santas, M.A.; Joseph W. Schellhardt, M.A.; Joanne F. Seiser, M.A.; Mary C. Sidney, M.A.; Stuart Jay Silverman, M.A.; Diane Smith, M.A.; Beatrice S. Timmis, M.A. (Emerita); Elizabeth H. VonVogt, M.A.; Dorothy E. Welker, Ph.D.; Eugene Wildman, M.A.

Assistants: Vincent J. Balleras, M.A.; Ronald W. Beukema, B.A.; Lawrence J. Bommer, M.A.; Janet Borneman, M.A.; Radmilla Brodich, B.A.; Joan H. Chesterton, B.A.; Paulina V. Doctor, B.A.; Richard W. Doctor, B.A.; Patricia M. Dunham, B.A.; William Dunne, B.A.; Ruth Eckdish, M.A.; Cynthia K. Edelman, M.A.; Ellen L. Farnsworth, B.A.; Sharon W. Franco, B.A.; Donald K. Garfield, M.A.; Gwyneth D. Gillingham, M.A.T.; Susan Grathwohl, B.A.; Elizabeth J. Jander, A.B.; Anne H. Joel, M.A.; Ruta M. Juska, M.A.; Martha E. Kobayashi, B.A.; Basil E. LaGoudes, M.S.; Elizabeth LeBlanc, B.A.; Karen C. Levinson, A.B.; Patricia A. Meckstroth, M.A.; Gregory A. Norton, B.A.; James R. Novotny, M.A.; M. Patricia O'Rourke, B.A.; Patricia M. Patsis, M.A.; John M. Perlette, M.A.; Robert R. Rauch, A.B.; Dace Rice, M.A.; Russell F. Rogers, B.A.; Judith G. Rosenberg, M.A.; Daniel L. Sales, M.A.; Dennis M. Shmigelsky, B.A.; Catherine W. Simonson, M.A.; Elizabeth C. Thieme, M.A.; Richard F. Thieme, M.A.; Natalie M. Uslenghi, A.M.; Karen H. Viermeisel, M.A.; Ralph S. White, B.A.; Willard E. White, M.A.; Jane Zakrzewski, M.A.

Lecturers: Margaret M. Angoli, M.A.; Elias Argott, M.A.; Edward Aronson, M.A.; Douglas K. Casement, M.A., D.D.; Charles E. Franklin, B.A.; Paul Han, M.A.; Jerrilou Johnson, M.A.; Donald L. Lee, A.A.; Deborah Leonard, M.A.; Joseph F.S. Mabwa, B.A.; John N. Roberts, M.A., D.D.; Melanie A. Wozniak, B.A.

Major—36 hours, exclusive of 100-level courses, including the following:

Note: 100-level courses in English do not count toward the major. English 150, 151, 152, taken in sequence, are prerequisites for all 200 and 300-level courses in English for the major and must be taken by transfers who have not had equivalent courses.

Specialization in American Literature

English 231 or 232; 255, 256, 257, 234, 301 or 315

4 hours from 310, 350, 355, 386, 389

4 hours from 288, 316, 375, 376, 377, 380, 385, 388, 392, 393, 394

plus 4 hours from any other 200-level or 300-level courses in American or English literature.

Specialization in English Literature

English 231 or 232, 234, 301 or 315

4 hours from *each* of the following:

American literature

English literature prior to 1660

English literature from 1660 to 1800

English literature from 1800 to 1900

English literature of the twentieth century

plus 4 hours from any other 200-level or 300-level courses in American or English literature.

Departmental Distinction: Grades of A or B in English 298, three senior honors seminars or a cumulative grade-point average of 4.5 in all English, humanities, and rhetoric courses and 6 quarters in residence at the University of Illinois at Chicago Circle. Senior honors seminars are open to students of superior ability and achievement. Admission is by application to and approval of the department.

Freshmen and sophomores who demonstrate superior scholarship may participate in the freshman and sophomore honors programs by invitation.

Minor—Students from other departments who wish to minor in English must take at least 20 hours in English courses. A minimum of 12 hours must be at the 200 or 300 level, including courses in Shakespeare, literary criticism, the English language, and American literature. Courses taken in fulfillment of a general education requirement may not be used.

Teacher Education in English: Requirements for Teaching in Secondary Schools

Major—52 hours

Rhetoric 133

English 231, 150, 151, 152

210, 255, 256, 257, 295

301, 234, any 200-level or

300-level course in English. (English 111 is recommended for prospective teachers in the Chicago school system.)

Minor—32 hours

Rhetoric 133

English 150, 151, 152,

255, 256, 257, 295

French

Professors: William M. Schuyler, Ph.D., Head of the Department; Robert E. Hallowell, Ph.D.; Marie E. Lein, Ph.D.; Charles M. Lombard, Ph.D.

Associate Professors: Kenneth I. Perry, Ph.D.; Franklin P. Sweetser, Ph.D.; Marie-Odile Sweetser, Ph.D.; Dorothy R. Thelander, Ph.D.

Assistant Professors: Edmund J. Bender, Ph.D.; Priscilla P. Clark, Ph.D.; Peter V. Conroy, Jr., Ph.D.; Edna S. Epstein, Ph.D.; Joy N. Humes, Ph.D.; Barbara G. Mittman, Ph.D.; June Moravcevic, Ph.D.; Clara S. Skogen, M.A.; Yvonne B. Weinstein, *Diplome d'Etudes Superieures*.

Instructors: Raymond M. Archer, M.A.; Dorothy G. Barber, M.A.; Janet Eisenberg, M.A.; Pierre Gerber, M.A.; Douglas E. Johnson, M.A.; Carrie D. Moore, M.A.; Sylvia Patlogan, M.A.; Mary Eloise Ragland, D.A.; Gary C. Rundquist, M.A.; Marcelle Sylvan, M.A.; Nancy A. Tomasek, M.A.

Major—for the degree of Bachelor of Arts, a minimum of 54 hours (excluding all 100-level courses) including the following:

French 201, 202, 203, 209, 210, 211, and 24 hours of 300-level courses in French, including 313 or 314.

In addition, 12 hours of French electives must be chosen with the consent of an adviser.

It is recommended that French majors take one year of English literature and one year of European history.

A comprehensive examination is required of all majors in their last quarter of residence. Students enrolled for practice teaching during their last quarter may take the examination at an earlier date.

Related Fields—French majors may also choose one of three related fields as follows:

French Studies—

48 hours, including

Art history	3 hours
History of music	3
Classics and/or humanities	6
History	12
Philosophy and/or political science	4
English	8
Electives	12

Comparative Literature—

48 hours, including

Classics	8 hours
English literature	8
German literature	4
Spanish literature	3
Humanities	8
Electives	17

Foreign Language Studies—48 hours, with a minimum of 36 hours in a second foreign language, and twelve hours of foreign language electives.

Courses in any of the three related fields must be chosen with the consent of an adviser.

Departmental Distinction: Recommendation is based on a 4.500 average in all courses counted for the major and a grade of A on the departmental comprehensive examination.

Minor—Students from other departments who wish to minor in French must take from 24 to 32 hours in French, including a maximum of 12 in French 104, 105, 106 or 100, 111, 112 or 114, 115, 116 (if needed), and 18-24 hours in courses at the 200 level or above, chosen with the approval of the Department of French.

Teacher Education in French: Requirements for Teaching in Secondary Schools

Major—39 hours

French 201, 202, 203
209, 210, 211
281, 282
18 hours of 300-level courses
including 313 or 314

Minor— 30 hours

French 104, 105, 106
or 110, 111, 112
or 114, 115, 116
201, 202, 203
209, 210, 211
282 is recommended

Geography

Clifford E. Tiedemann, Ph.D., Head of the Department

Professors: Alden D. Cutshall, Ph.D.

Associate Professors: Mary M. Colby, Ph.D. (Emerita); Edwin H. Draine, Ph.D.; Mildred I. Finney, Ph.D.; James E. Landing, Ph.D.; David M. Solzman, Ph.D.; Clifford E. Tiedemann, Ph.D.

Assistant Professors: Bruce G. Gladfelter, Ph.D.; Albert J. Larson, Ph.D.; Siim Sööt, Ph.D.

Instructors: David E. Bartlett, M.A.; Yehoshua Cohen, M.A.; Kenneth L. Kartz, M.A., Burton A. Kessler, M.A.; Adam Pertkiewicz, M.A.; Danuta Z. Schneider, M.A.; Walter F. Wacht, M.A.

Lecturers: Minna C. Greene, M.A.

Assistants: Leo Cronin, A.B.

Major—for the degree of Bachelor of Arts, 45 hours, at least 20 of which must be in upper-level courses, distributed as follows:

3 courses in physical geography (may be met by a physical science sequence in geology together with Geography 102 and 103)

2 courses in regional geography, including Geography 221

2 upper-level systematic courses, exclusive of those in physical geography Geography 351 or 355 or 357, and 13 additional hours in geography.

Geography majors are assigned a departmental adviser.

Departmental Distinction: Consult the departmental adviser. Enrollment in Geography 391 and eligibility for graduation with college honors.

Minor—Students from other departments who wish to minor in geography must take at least one course in physical geography, one in systematic geography, one advanced course in regional geography, and electives to bring the total to 20 hours. Courses must be chosen with the consent of an adviser in the Department of Geography.

Teacher Education in Geography: Requirements for Teaching in Secondary Schools

Major—48 hours

Geography 101, 102, 103
104, 109, 114, 221, and
19 additional hours of
200-level courses in-
cluding at least one
additional regional
course

Electives: 10-34 hours

Minor—35 hours

Geography 101, 102, 103
104, 109, 221 and 10
Additional hours of
200-level courses including
one additional regional
course

Geological Sciences

Professors: Werner H. Baur, *Dr. rer. nat.*, Head of the Department; Robert W. Karpinski, *D. es. Sc.* (Emeritus); Richard B. McCammon, Ph.D.; Edward J. Olsen, Ph.D. (Adjunct)

Associate Professors: Robert E. DeMar, Ph.D.; Helen M. McCammon, Ph.D. (Adjunct); Kelvin S. Rodolfo, Ph.D.; Walter Sadlick, Ph.D.

Assistant Professors: David W. Baker, Ph.D.; John R. Bolt, Ph.D.; Warren C. Forbes, Ph.D.; Aijaz A. Khan, Ph.D. (Visiting); A.F. Koster van Groos, Ph.D.; Zubair A. Saleem, Ph.D.; Norman D. Smith, Ph.D.

Assistants: W. Owen BeMent, B.S.; Alan J. Birkner, B.S.; Barbara A. Buss, B.S.; Diana L. Duckworth, B.S.; John S. Janks, B.S.; Anthony R. Kampf, B.S.; Firemon K. Kasaato, B.S.; David T. Long, B.S.; John E. McArdle, B.S.; David P. Ripley, B.S.; Petr Skalník, B.S.; Steven I. Zarbin, B.S.

Major—for the degree of Bachelor of Science, 54 to 57 hours, distributed as follows:

Geological Sciences 101, 102, 103 and 30 hours of advanced courses in geological sciences chosen with the approval of the department. Included should be a field course (which cannot count more than 4 hours toward the major) and Chemistry 112, 113, 114, which are prerequisites for several geological sciences courses.

Required Prerequisite and Collateral Courses—34 hours to 43 hours, including
 Mathematics¹ 130, 131, 132, 133
 Physics² 101, 102, 103

¹ Students without appropriate entrance credit must also take Mathematics 104 and 105 and Chemistry 111.

² Students interested in geophysics, geochemistry and some other areas should substitute Physics 111, 112, 113.

Departmental Distinction: To be recommended for graduation with departmental distinction in any of the programs of the Department of Geological Sciences a student must have a grade-point average of 4.00 or better (exclusive of military science and physical education) and must perform creditably in Geological Sciences 299.

Minor—Students from other departments who wish to minor in geological sciences must take 27 hours, chosen with the approval of the department. A maximum of 15 hours may be at the 100 level. Geological Sciences 110 is usually required.

Teacher Education in the Earth Sciences: Requirements for Teaching in Secondary Schools

Major—46 to 52 hours, distributed as follows:

Geological Sciences 101, 102, 103

20 hours of advanced courses chosen with the advice of the department.

6-12 hours of an approved summer field course.

Geography 102, 103

Supporting Courses—37 to 41 quarter hours, distributed as follows:

Mathematics 130, 131

Physics—3 quarters

Chemistry 112, 113, 114 or equivalent

Major requirements are somewhat flexible. In certain cases substitutions of courses in physics, chemistry, biology, mathematics, or geography may be made with approval of the departmental adviser. Geology 110 may be substituted for the summer field course with the consent of the departmental adviser provided 4 additional hours of advanced geology are taken. Students interested in this major should see an adviser from the Geological Sciences Department in the first quarter of the freshman year.

German

Professors: Robert R. Heitner, Ph.D., Head of the Department; Lee B. Jennings, Ph.D.; Robert Kauf, Ph.D.; Daniel C. McCluney, Jr., Ph.D.; Leroy R. Shaw, Ph.D.; Elizabeth Teichmann, Ph.D.; Hazel C. Vardaman, Ph.D.

Associate Professors: Arnold J. Hartoch, Ph.D.; Ernest S. Willner, Ph.D.

Assistant Professors: Thomas A. Buesch, Ph.D.; Heinz C. Christiansen, Ph.D.; Daniel G. Harrington, M.A.; Else Huenert-Hofmann, Ph.D.; Brian O. Murdoch, Ph.D.; Karl F. Otto, Jr., Ph.D.; Marilyn Torbruegge, Ph.D.

Instructors: Frederick Betz, M.A.; Johanna Braunfeld, M.A. (Emerita); George Huenert, M.A.; Edward J. Stone, M.A.; David M. Weible, M.A.

Major—for the degree of Bachelor of Arts, 43 hours in 200-level courses (exclusive of courses given in translation and German 206, 207, 220, and 240), including:

German 201, 202, 203, 204, 221, 230, 290, 292, 294

8 additional hours of 300-level courses

Note: German 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 121, 122, 123, 124, 125, 126, 185, 190, 191, 192, 195, 250, 251 are excluded from the major.

Required Collateral Courses—24 hours, to be chosen in consultation with the departmental adviser.

Honors—Students who wish to be recommended for honors must also complete German 298.

Minor—Students from other departments who wish to minor in German must take a minimum of 19 hours at the 200 level or above, selected with the approval of the Department of German.

Teacher Education in German: Requirements for Teaching in Secondary Schools

Major—48 hours

German 201, 202, 203, 204, 206,
220, 221, 230, 240, 290,
292, 294
4 additional hours selected from
207 or any 300-level course

Minor—30 hours

German 104, 105, 106 or
124, 125, 126
201, 202, 203
6 additional hours
selected from 204, 220,
221, 230

Options for satisfaction of the second year of the foreign language requirement:

Four skills: German 104, 105, 106

Reading: German 107 and 108 or 109 and 110 or 111 or 112

Conversation: In lieu of 106, 110, 111, or 112, two courses of the sequence 113, 114, 115 may be taken either after or together with 104, 105, 107, 108, and 109.

Enrichment: Prospective majors and minors are encouraged to take all or part of the two-year sequence 121, 122, 123, 124, 125, 126.

History

Professors: Robert V. Remini, Ph.D., Chairman of the Department; Shirley A. Bill, Ph.D.; Bentley B. Gilbert, Ph.D.; Louis Gottschalk, Ph.D. (Visiting); Peter d'A. Jones, Ph.D.; Stanley Mellon, Ph.D.; Robert L. Nicholson, Ph.D.; Gilbert Osofsky, Ph.D.; Max Savelle, Ph.D. (Visiting); Edward C. Thaden, Ph.D.; John B. Wolf, Ph.D.

Associate Professors: Peter J. Coleman, Ph.D.; James E. Cracraft, Ph.D.; Carolyn A. Edie, Ph.D.; Robert L. Hess, Ph.D.; Melvin G. Holli, Ph.D.; George Huppert, Ph.D.; Richard Jensen, Ph.D.; Ronald P. Legon, Ph.D.; Peter R. McKeon, Ph.D.; Richard Millman, Ph.D.; Karl A. Schleunes, Ph.D.

Assistant Professors: Ira Berlin, Ph.D.; Burton J. Bledstein, Ph.D.; Robert E. Conrad, Ph.D.; Gerald A. Danzer, Ph.D.; Arthur Donovan, Ph.D.; William A. Hoisington, Ph.D.; David Jordan, Ph.D.; Charles R. McKirdy, Ph.D.; Marion S. Miller, Ph.D. (Visiting); David S. Patterson, Ph.D.; Michael Perman, Ph.D.; James J. Robbins, Ph.D.; Joan Scott, Ph.D.; Peter W. Stanley, Ph.D.

Instructors: Thomas A. Askew, Ph.D.; Larry Danielson, M.A.; Philip H. Dreyer, M.A.; Frederica C. Harris, M.A.; Donald J. Klimovich, M.A.; William A. Peters, M.A.; Andrew K. Prinz, Ph.D.

Lecturers: LaRay Denzer, M.A.; Hugo Leaming, B.A., B.D. (Visiting); Takeko Stover, M.A. (Visiting).

Assistants: Charles Balesi, B.A.; Paul Barrett, M.A.; Brandon Beck, M.A.; Thomas B. Bullard, M.A.; Yeshaiah S. Cahana, M.A.; Barbara D. Campbell, M.A.; Robert Cudaback, M.A.; James C. Dean, M.A.; Linda DeGrand, M.A.; Nazaris DeVine, B.A.; Hasia Diner, M.A.T.; Barbara Farr, M.A.; Frances Feinerman, M.A.; Mary Finn, M.A.; Pericles B. Georges, B.A.; Mary Ann Gerber, M.A.; Benjamin E. Haddox, M.A.; Lynn Henderson, B.A.; Richard C. Holbrook, M.A.; Rosemary Keller, M.A.; Norman M. Klein,

M.A.; Philip Kozlowski, M.A.; Marla S. Kruglik, M.A.; Robert M. Lamont, B.A.; Gregory Lennes, B.A.; Eileen Mackevich, M.A.; Christine McHugh, M.A.; David J. Miller, B.A.; Jacqueline L. Peterson, B.A.; Robert M. Rosenberg, B.A.; Judithrae E. Ross, M.A.; Barbara C. Sciacchitano, B.A.; Barry Smith, B.A.; Muriel B. Stone, B.A.; George G. Taylor, M.A.; Zdenko Zlatar, M.A.

Major—for the degree of Bachelor of Arts, 45 hours, distributed as follows:

100-level courses	9 hours (maximum)
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200 and 300-level courses:

United States history	12
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European history since 1450	12
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A third field of history	12
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All majors are assigned a departmental adviser.

Departmental Distinction: A 4.50 all-University average and a 4.75 in all courses taken in the Department of History at Chicago Circle.

Minor—Students from other departments who wish to minor in history must take at least 30 hours of United States and European history, with at least 14 hours in courses at the 200 or 300 level.

Teacher Education in History: Requirements for Teaching in Secondary Schools

Major—48 hours

History 111, 112, 113, or equivalents,

151, 152, 153 or equivalents

United States history	9-12 hours, 200-300 level
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European history since 1450	9-12 hours, 200-300 level
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Courses in fields other than

United States and modern

European history	9-12 hours, 200-300 level
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The Department of History does not require its teacher education majors to offer a minor field.

Mathematics

Professors: Joseph Landin, Ph.D., Head of the Department; Herbert J. Curtis, Ph.D., Executive Secretary; Harold W. Bailey, Ph.D.; Norman Blackburn, Ph.D.; Flora Dinkines, Ph.D.; Philip Dwinger, Ph.D.; Irwin K. Feinstein, Ph.D.; Paul Fong, Ph.D.; Evelyn Frank, Ph.D.; Henry L. Garabedian, Ph.D. (Emeritus); Victor K.A.M. Gugenheim, Ph.D.; Norman T. Hamilton, Ph.D.; Miles C. Hartley, Ph.D. (Emeritus); Noboru Ito, Ph.D.; Shmuel Kantorovitz, Ph.D.; Marvin I. Knopp, Ph.D.; David A. Page, M.A.; Louis L. Pennisi, Ph.D.; Reuben I. Sandler, Ph.D.; W. Forrest Stinespring, Ph.D.; Victor Twersky, Ph.D.

Associate Professors: Furio Alberti, Ph.D.; Helmut Bender, Ph.D. (Visiting); Warren H. Brothers, Ph.D.; Djairo DeFigueiredo, Ph.D.; David A. Foulser, Ph.D.; Louis I. Gordon, Ph.D.; Brayton I. Gray, Ph.D.; Richard A. Handelsman, Ph.D.; Alice G. Hart, M.S.; Louise Hay, Ph.D.; Christoph H. Hering, Ph.D.; William A. Howard, Ph.D.; William M. Kantor, Ph.D.; James J. Kelleher, Ph.D.; Richard G. Larson, Ph.D.; James W. Moeller,

Ph.D.; Kenneth H. Murphy, M.S.; Pramod K. Pathak, Ph.D.; G.V. Ramanathan, Ph.D.; Neil W. Rickert, Ph.D.; Robert I. Soare, Ph.D.; Alexander P. Stone, Ph.D.; Avrum I. Weinzwieg, Ph.D.; Alexander Zabrodsky, Ph.D.

Assistant Professors: Ruth M. Ballard, Ph.D.; Neil E. Berger, Ph.D.; Winifred V. Berglund, M.A.; Bernard M. Berlowitz, Ph.D.; Joel D. Berman, Ph.D.; Raymond T. Czerwinski, Ph.D.; James A. Donaldson, Ph.D.; Verena H. Dyson, Ph.D.; Helmut P. Epp, Ph.D.; Samuel Feder, Ph.D.; Gerald L. Gordon, Ph.D.; Robert N. Grannick, Ph.D.; Floyd B. Hanson, Ph.D.; Morton E. Harris, Ph.D.; Melvin L. Heard, Ph.D.; Roger G. Hill, B.A.; Oddvar Iden, Ph.D. (Visiting); Steven L. Jordan, Ph.D.; Carol S. Knighten, Ph.D.; Robert L. Knighten, Ph.D.; Sim Lasher, Ph.D.; Jeff E. Lewis, Ph.D.; Julia B. Linn, M.S.; Mu-Chou Liu, Ph.D.; Jeannette S. Lumley, M.A.; Robert P. Martineau, Ph.D. (Visiting); Alan McConnell, Ph.D.; Hans J. Munkholm, M.S.; Grace M. Nolan, M.S.; Thomas B. Ondrak, M.S.; Arthur T. Pu, Ph.D.; Lena C. Pu, Ph.D.; T.E.S. Raghavan, Ph.D.; Yao-Chun Rickert, Ph.D.; Nicholas C. Scholomiti, M.A.; Helen W. Sears, M.A.; Lawrence R. Sjoblom, B.S.; Martin C. Tangora, Ph.D.; Rose L. Vedral, M.A.; Glenn P. Weller, Ph.D.; Rosemary F. Wiley, M.A.; Leo F. Ziomek, Ph.D.

Instructors: Kathleen M. Hotton, M.A.; Betty J. Kuzmanic, M. Ed.; Charles E. Olsen, B.S. (Emeritus); Rose L. Shook, M.A. (Emerita)

Assistants: Peter F. Ash, B.A.; Ib Axelsen, M.S.; Oscar E. Barriga, M.S.; Ronald G. Beckman, M.S.; Richard D. Bentley, B.A.; Joel Bernstein, B.S.; Mary M. Bork, B.S.; Alan J. Burger, M.A.; Mario B. Caldarone, B.S.; Irene R. Cannata, B.S.; Hubert H. Chin, M.A.; Carroll Delaney, B.A.; Afrodite Demopoulos, B.S.; William B. Duffie, M.A.T.; Jui-Tung Fang, M.S.; Thomas P. Farrell, B.S.; David C. Feinstein, M.S.; Gabor Fencsik, B.S.; Sharon E. Fine, M.A.; Timothy J. Foley, B.S.; Diane M. Gabrisko, B.S.; George E. Gajnak, B.S.; Nancy L. Hickman, B.A.; Thomas J. Hoppens, M.S.; Ming-Ming Hsu, B.S.; Miranda Y. Hu, B.S.; Anthony Hughes, M.S.; Erwin S. Janush, M.S.; Richard Jenson, B.A.; Shyam Johari, M.S.; Jimmie L. Johnson, M.S.; Calvin Kafka, B.S.; Donald G. Lambe, B.S.; Theresa C. Lee, B.S.; Eng Bin Lim, M.S.; Bing-Ying Lin, B.S.; Manuel G. Liristis, B.S.; Milda M. Lisauskas, M.S.; David L.Y. Liu, M.S.; Gary L. Marotta, B.A.; Donald Mazzulla, B.S.; Gene A. McGrady, B.S.; Marjorie W. McNichols, M.A.; George A. Milauskas, B.S.; Ellen S. Munkholm, M.S.; Richard E. Nicholson, B.S.; Michael S. Olshansky, B.S.; Mark D. Pankin, M.S.; Manuel J. Parra, M.S.; Louise A. Parson, B.A.; Jose Reyes, Jr., B.S.; Lance R. Robinson, M.A.; Sandra N. Sandeen, B.S.; Frederick A. Schaedel, B.S.; Peter S. Schiltz, M.A.; Ira Slotnick, M.S.; Waldemar Smieliauskas, B.S.; Lester Szewczyk, B.S.; Alex C. Thannikkary, M.S.; Marcia L. Tharp, B.S.; Frederick A. Thulin, B.S.; Damber S. Tomer, M.S.; Dennis B. Wallis, B.S.; Rhonda J. Weisberg, B.S.; Marietta Wike, M.A.; Floyd E. Willmore, M.A.; Rina Y. Wong, B.S.; Carol E. Yount, B.A.; Robert M. Zimmerman, M.A.

Major—for the degree of Bachelor of Science, 56 hours, which must include:

Mathematics 130, 131, 132, 133	20 hours
340, 341, 342	9

Three courses from 310, 311, 312, 313, 314, and 315	10 hours
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Usually a student will take 310, 311, and 312, or 313, 314, and 315, but other combinations are permissible if a departmental adviser approves.

The remaining hours are to be chosen from mathematics courses numbered 195 or higher with the exception of 300, 301, 302, and 348. A student must have an average of at least 3.25 in all mathematics courses beyond 133 in which he has received credit. Each mathematics major is assigned a departmental adviser and the student's choice of courses must be approved by the adviser.

Transfer Students. A transfer student must have credit in at least 18 hours of 300-level mathematics courses taken on this campus.

Required Prerequisite and Collateral Courses—A student majoring in mathematics must either elect to take an approved minor in another department or have 24 hours of credit in a program of collateral courses approved by a departmental adviser and chosen from one or two of the following fields: biological sciences, chemistry, economics, French, geology, German, philosophy, physics, or Russian. Enrollment in courses in other fields may be requested by petition to the head of the department.

A student who intends to major in mathematics but lacks the prerequisites to begin with Mathematics 130 may obtain credit for college algebra and trigonometry by taking Mathematics 104 and 105 or 100 and 101. However, none of these courses may be applied toward the 56 hours of credit required for the degree.

Honors Courses. Honors sections of some courses in mathematics are offered throughout the year. For details see the Timetables. Admission to honors sections is not restricted to mathematics majors, but consent of the department is required.

Departmental Distinction: The student must qualify for college honors and must have done exceptional work in mathematics, as determined by the department. Generally a 4.500 average on all upper division work is required.

Minor—Students from other departments who wish to minor in mathematics must complete Mathematics 130, 131, 132, 133, and 12 hours of mathematics courses at the 200 or 300 level.

Teacher Education in Mathematics: Requirements for Teaching in Secondary Schools

Major—55-57 hours

Mathematics 130, 131, 132, 133

300, 301, 302, 303, 304

305, 307, 310, 340, 341

342 or 348

Electives: 5-19 hours

Minor—34-36 hours

Mathematics 130, 131, 132, 133

300, 307

301 and 302 or

340 and 303 or

348 and 303

Students in the Teacher Education in Mathematics curriculum must have a cumulative grade-point average in mathematics courses of not less than 3.500 to be recommended for Education 270, *Student Teaching*. Students are strongly urged to choose electives from areas of study which will support their major programs. The departmental advisers for this curriculum are available to assist the student in the selection of such courses.

Curriculum in Mathematics and Computer Science

Designed for students who seek careers in systems and/or mathematical programming. Students who successfully complete the program are awarded the degree of Bachelor of Science in Mathematics and Computer Science. Students in this curriculum who plan to continue into graduate studies are urged to include among their elective courses as many 300-level mathematics courses as possible, especially 310, 311, 312, 340, 341, 342. The requirements of the curriculum are:

Rhetoric 101, 102	8 hours
Credit or exemption in 106 of a modern language	0-24
Liberal Arts and Sciences area requirements in humanities and social sciences	24
Mathematics 130, 131, 132, 133, 195, 220, 250 ¹ 280, 281, 290, and 348 ²	45
Mathematics 307 or 310 or 343	4 or 5
Three courses selected from Mathematics 387 through 397	9
Physics 111, 112, 113	14
Information Engineering 210	5
Two courses selected from Information Engineering 212, 240, 311, 340	8
Electives	38-63

¹ With the consent of the adviser Mathematics 370 and Mathematics 371 may be taken instead of Mathematics 250.

² With the consent of the adviser Mathematics 341 and Mathematics 342 may be taken instead of Mathematics 348.

Music

Milan Kaderavek, D.Mus., Head of the Department

Professors: Agnes C. Schuldt, M.Mus. (Visiting)

Associate Professors: Milan Kaderavek, D.Mus.

Assistant Professors: Euana B. Gangware, M.Mus.; William M. Kaplan, D.Mus.; Richard E. Norton, Ph.D.; Nicholas J. Valenziano, M.Mus.

Instructors: Richard D. Billingham, M.Mus.; Maxine E. Mandell, M.Mus.

Lecturers: Harriette F. Tiegreen

Students must pass a placement examination to qualify as music majors or to elect a minor field of specialization in the Department of Music. Those who fail this examination may petition the department for individual consultation. Credit earned in Music 100 may not be applied toward the major or the minor field of specialization.

Major—for the degree of Bachelor of Arts, 60 hours, including:

Music 101, 102, 103, 104, 105, 106, 170, 171,
201, 202, 203, 204, 205, 206, 230, 231,
232, 300, 301, 302 and three hours to be selected
from the following¹: 151, 152, 153, 154, 155, 156, 158.

¹No more than ½ hour credit earned in any quarter may be applied toward the three-hour requirement in these courses.

Departmental Distinction: A candidate must be eligible for college honors and must have an average of 4.5 in all courses taken in the Department of Music.

Minor—Students from other departments who wish to minor in music must take 32 hours, including:

Music 101, 102, 103, 104, 105, 106,
170, 130, 231, 232, and two hours from
Music 151, 152, 153, 154, 156, 158, 171

Philosophy

Professors: Donald A. Wells, Ph.D., Chairman; George T. Dickie, Ph.D.; Daniel J. Morris, Ph.D.; George Schlesinger, Ph.D.; Brian F. Skyrms, Ph.D.; William W. Tait, Ph.D.; Irving Thalberg, Ph.D.

Associate Professors: Sandra L. Bartky, Ph.D.; Terence Parsons, Ph.D.

Assistant Professors: David C. Blumenfeld, Ph.D.; Marcia M. Eaton, Ph.D.; John J. Economos, B.A. (Visiting); Richard Kraut, Ph.D.; Ralf Meerbote, Ph.D.; Robert R. Page, M.A.; Kathryn P. Parsons, Ph.D.; Paul Teller, Ph.D.; Robert Tragesser, Ph.D. (Visiting); W. Kent Wilson, Ph.D.; Jeffery Zucker, M.S. (Visiting).

Instructors: Daniel P. Berger, M.A.; Neal K. Grossman, M.A.; Michael Jubien, B.A.

Major—for the degree of Bachelor of Arts, 42 hours, including:

Philosophy 201, 203, 211, 330, 332
22 additional hours in philosophy
Philosophy 299, Seminar, is recommended
Majors are assigned a departmental adviser.

Departmental Distinction: Awarded by the department on the basis of course work plus an original paper. Consult with the department about eligibility and procedures to be followed.

Minor—Students from other departments who wish to minor in philosophy must take 20 hours in philosophy, 12 of which must be at the 200 or 300 level.

Physics

Professors: Swaminatha Sundaram, D. Sc., Head of the Department; Seymour Bernstein, Ph.D.; Arnold R. Bodmer, Ph.D.; James W. Garland, Ph.D.; James S. Kouvel, Ph.D.; Edward B. McNeil, Ph.D.; Rupert M. Price, M.S. (Emeritus); Ora L. Railsback, Ph.D. (Emeritus); R. Curtis Retherford, Ph.D.; Herman B. Weissman, Ph.D.; Lester Winsberg, Ph.D.

Associate Professors: Stanley Aks, Ph.D.; William R. Anderson, M.S.; Richard A. Carhart, Ph.D.; Alan S. Edelstein, Ph.D.; Howard S. Goldberg, Ph.D.; Gloria T. Hoff, Ph.D.; Herman J. Johnson, M.S.; Stephen J. Krieger, Ph.D.; Seymour Margulies, Ph.D.; William J. Otting, Ph.D.; Antonio Pagnamenta, Ph.D.; John N. Pappademos, Ph.D.; David S. Schreiber, Ph.D.; Ram R. Sharma, Ph.D.; Harold M. Skadeland, M.A.; Julius Solomon, Ph.D.; David J. Vezzetti, Ph.D.

Assistant Professors: Larry L. Abels, Ph.D.; Robert J. Abrams, Ph.D.; Helmut Claus, Ph.D.; Jared W. Haslett, M.S.; Jerome E. Jackson, Ph.D. (Visiting); Jack A. Kaeck, Ph.D.; Isidor Lerner, M.A. (Emeritus); Arthur L. Licht, Ph.D. (Visiting); Donald W. McLeod, Ph.D.; Fischel E. Morraine, *Dipl. Ing.* (Emeritus); James G. Ring, Ph.D. (Visiting); Josip Z. Soln, Ph.D. (Visiting); Norman D. Strahm, Ph.D. (Visiting); Ben Varga, Ph.D.

Lecturers: Frank A. Costanzi, Ph.D. (Visiting).

Assistants: Steven P. Ahlen, B.S.; Robert G. Aitken, B.S.; Robert K. Bender, B.S.; Narong Chaikul, M.S.; Chin-Sheng Chien, M.S.; Howard A. Cozzi, M.S.; Charles J. Crabb, B.S.; Gerald T. Cuzelis, B.S.; Leonard M. DeBall, M.S.; Joseph F. DeMelo, M. Sc.; David C. Dong, M.S.; Naim Elyashar, M.S.; Stewart O. Fong, M.S.; Antonios Gonis, M.S.; James M. Jackimiec, M.S.; Siraj M. Khan, M.S.; Lawrence M. Klonowski, M.S.; Jerome E. Majewski, B.S.; Arthur L. Mazza, M.S.; Edward Moy, B.S.; Leland G. Neuberg, M.S.; Panagiotis Panagoulas, B.S.; Donna M. Ruberticchio, B.S.; Annapoorni Shadagopan, M. Sc.; Vengipura Shadagopan, M.S.; Ashok K. Sharma, M. Sc.; Bung-Ning Teng, M. Sc.; Vasundara Venkatraman, M. Sc.; Randall F. Wade, M.S.; Russell Whitman, M.S.; Leonard W. Winchester, M.S.; Chung C. Wong, M.S.; William P. Wood, B.S.

Research Assistants: William C. Muellner, M.S.; Lambert H. Schoonveld, M.S.

Major—for the degree of Bachelor of Arts, 56 hours, including the following:

Physics 111, 112, 113, 114	19 Hours
221, 222	5
301, 302	8
321, 322	8
341, 361	8

plus two 300-level physics courses to be chosen in consultation with the adviser.

Required Prerequisite and Collateral Courses—

Mathematics 104 and 105 (if needed), 130, 131,

132, 133, 220, 310, 311

Chemistry 112, 113, 114

Note: Students may substitute, on the advice of the department, Chemistry 117, 118, 119 for Chemistry 112, 113, 114 if total hours required in their program do not exceed 108.

Department Distinction: Candidates must register for Physics 291, 292, or 293 to be considered. Awards of Distinction, High Distinction, and Highest Distinction will be based on the overall quality of the student's course work and the recommendation of the instructor in the above courses.

Minor—Students from other departments who wish to minor in physics must take Physics 111, 112, 113, 114, 221, 222, 301 and one course from the following: Physics 321, 371, 331, 341, 302.

Teacher Education in Physics: Requirements for Teaching in Secondary Schools

Major—56 hours including the following:

Physics 111, 112, 113, 114	19 Hours
221, 222	5
301, 302	8
321, 322	8
341, 361	8

Supporting Courses—42 hours

Mathematics 130, 131, 132, 133	20 Hours
220, 310, 311	10
Chemistry 112, 113, 114	12

Plus two physics laboratory courses, chosen in consultation with the adviser.

Minor—(Second field of specialization)—31 hours

Physics 111, 112, 113, 114	19 Hours
221	4
Physics electives	8

The Physics Curriculum

The degree of Bachelor of Sciences in Physics is awarded students who successfully complete this curriculum in the College of Liberal Arts and Sciences.

180 hours, exclusive of physical education and basic military science, distributed as follows:

Rhetoric 101, 102	8 Hours
Chemistry 117, 118, 119	18
Foreign language (the equivalent of two years in a single language, at the college level)	0-24
Social Science	12
Humanities	12
Mathematics 130, 131, 132, 133	20
220, 310, 311	10

Physics 111, 112, 113, 114	19
221, 222	5
301, 302, 303, 304	16
321, 322, 341, 342	16
361, 371, 381, 382	16
Electives	9-33

Political Science

Professors: Richard M. Johnson, Ph.D., Head of the Department; Hollis W. Barber, Ph.D.; Twiley W. Barker, Jr., Ph.D.; Doris A. Graber, Ph.D.; Boyd R. Keenan, Ph.D.; Milton Rakove, Ph.D.

Associate Professors: George D. Beam, Ph.D.; Leonard E. Goodall, Ph.D.; David C. Leege, Ph.D.; Lyman A. Kellstedt, Ph.D.; Byung C. Koh, Ph.D.; Frank Tachau, Ph.D.

Assistant Professors: Anne M. Heinz, Ph.D.; Catherine M. Kelleher, Ph.D.; Peter R. Knauss, Ph.D.; Michael A. Murray, Ph.D.; Dick W. Simpson, Ph.D.

Instructors: George I. Balch, M.A.; Edwin J. Bell, M.A.; Malcolm G. Hicks, B.A.; Charles F. Levine, M.A.; Kaye M. Miller, M.A.

Assistants: Ronald D. Armagast, B.A.; Leonard S. Cohen, B.A.; Edwin T. Crego, B.A.; Jerry M. Engelson, B.A.; John G. Feely, B.A.; Paul S. Galen, B.S.; Lydia A. Glees, B.A.; Dale A. Harris, B.A.; Reynard A. Hayes, B.A.; Patricia B. Katzel, B.A.; Paul C. Kovich, B.A.; Herman D. Madnick, B.A.; Joan M. Maloney, B.A.; Thomas F. Nelson, B.A.; David I. Newman, B.A.; Judith H. Rossof, B.A.; William K. Rouse, B.A.; Janet L. Rubas, B.A.; Joseph W. Sawyerr, B.A.; Thomas E. Tulley, B.A.; Robert A. Whitebloom, B.A.; David J. Zeller, B.A.

Major—for the degree of Bachelor of Arts, 36 hours, distributed as follows:

Political Science 150, 151 or Political Science 120 and any other 100-level political science courses.

28 additional hours in political science

A major may include 5 hours from related departments, chosen with the advance approval of the department.

Departmental Distinction: To be considered for departmental distinction the student must have an all-University grade-point average of 4.250, an average of 4.500 in all his political science courses, must present an acceptable essay written while he is enrolled in Political Science 299 (both course and credits must be beyond those required for the major), and pass a comprehensive examination in political science. A student working in this program must expect to enroll in Political Science 299 for at least 4 hours credit during his tenth and/or eleventh quarters; thus, if he expects to graduate in June, he should enroll during the fall and/or winter quarters of his senior year. Further details may be obtained in the Department of Political Science Office.

Minor—Students from other departments who wish to minor in political science must take Political Science 150 and 151 or Political Science 120 and any other 100-level

political science course, as well as 16 additional hours of political science courses, 12 of which must be at the 200 or 300 level, chosen in consultation with an adviser in the Department of Political Science.

Psychology

Professors: Harry S. Upshaw, Ph.D., Head of the Department; Philip Ash, Ph.D.; Louis A. Berman, Ph.D.; Rosalind D. Cartwright, Ph.D.; John D. Davis, Ph.D.; Leonard D. Eron, Ph.D.; I.E. Farber, Ph.D.; Paul C. Greene, Ph.D.; Harold Klehr, Ph.D.; Eli A. Lipman, Ph.D.; Susan M. Markle, Ph.D.; Sheldon Rosenberg, Ph.D.

Associate Professors: Gershon B. Berkson, Ph.D.; Roger L. Dominowski, Ph.D.; Philip E. Freedman, Ph.D.; Allen H. Howard, Ph.D.; Vivian D. Lipman, Ph.D.; Nan E. McGehee, Ph.D.; Gerald M. Senf, Ph.D.; Herbert H. Stenson, Ph.D.; Robert S. Wyer, Ph.D.; Lucy C. Zaccaria, Ph.D.

Assistant Professors: Alan Benton, Ph.D.; Charles L. Gruder, Ph.D.; Ernest W. Kent, Ph.D.; Leon Miller, Ph.D.; Rolf A. Peterson, Ph.D.; Alexander J. Rosen, Ph.D.; Elliot L. Rubin, Ph.D.; Allan L. Seltzer, Ph.D.

Assistant Professors of Psychology in the Student Counseling Service: James W. Creaser, Ph.D.; Barry S. Greenwald, Ph.D.; Mary Jane Luetgert, Ph.D.; Chaya H. Roth, Ph.D.; Edward P. Sheridan, Ph.D.; Myron A. Whitman, Ph.D.

Instructors: Leonard P. Kroeker, Ph.D.

Assistants: Susan Andrews, B.A.; Roberta A. Barker, B.A.; Thomas Barrett, B.A.; Irwin Benovitz, B.A.; Sima Blue, B.A.; Patrica Boland, B.A.; John J. Brescia, B.A.; Joseph A. Buga, B.A.; Adalton C. Caram, B.A.; Mark E. Cohen, B.A.; Linda Crnic, B.A.; Mary P. Eitzen, B.A.; Carol J. Gill, B.A.; Bernard Glos, B.A.; Mary A. Gruber, B.A.; Michael Haymes, B.A.; Mary Ellen Hebda, B.A.; John W. Hennessy, B.A.; Randy L. Hoheisel, B.A.; Joan W. Hurst, B.A.; Jane P. Kaplan, B.A.; Alfred W. Kaszniak, B.A.; Deborah A. Kelfer, B.A.; Carole Lachman, B.S.; Joseph D. Livingston, B.A.; John Lyon, B.A.; Shaaron McCabe, B.A.; James T. Napolitan, B.A.; Linda L. Oyer, B.A.; Harold Polsky, M.A.; Margaret A. Roberts, B.A.; Daniel Romer, B.A.; Robert R. Ruttenberg, B.S.; William Schiller, B.S.; Joseph P. Stokes, M.A.; Alfred Stumpfhauser, B.S.; Suzanne H. Turner, B.S.; Orest E. Wasyliv, B.A.; Stanley F. Watson, B.S.; Nancy L. Weiss, B.S.; Cynthia K. West, B.A.; Evelyn A. Williams, B.A.; Michael S. Zolno, B.S.; Michael A. Zurakov, B.S.

Lecturers: Samuel S. Hung, Ph.D.; Judith Torney, Ph.D.; Theta H. Wolf, Ph.D.

General Major—for the degree of Bachelor of Arts (primarily for students in general liberal education), 36 hours, including:

Psychology 100 or 102 and 240 or 241 or 243

At least 20 hours in psychology courses numbered above 200

Eight hours in another social science

Behavioral Science Major—for the degree of Bachelor of Science (for students preparing for graduate work in psychology), 36 hours, including:

Psychology 100 or 102; 241, 243, and 291

At least three from Psychology 250, 251, 252, 256, 318

Three quarters of mathematics including either Mathematics 101 or 104, 110 and 194 or Mathematics 101

(or 104 and 105) and 130, 131, and 132

Philosophy 222

Departmental Distinction: A candidate must be eligible for College Honors, must satisfactorily complete the required program for behavioral science majors, and must complete a satisfactory thesis in Psychology 299.

Minor—Students from other departments who wish to minor in psychology must take a minimum of 20 hours, 12 of which must be at the 200 or 300 level.

Slavic Languages and Literatures

Associate Professors: Nicholas Moravcevic, Ph.D., Head of the Department; Elizabeth Pribic, Ph.D.; Samuel Sandler, Ph.D.

Assistant Professors: Wilma Hoffman, M.A.

Instructors: George J. Gutsche, M.A.; Jean L. Hellie, M.A.; M. Renata Hostynska, M.A.; Jon L. Lutz, M.A.; Wanda L. Sorgente, M.A.; Jana I. Tuzar, M.A.

For the degree of Bachelor of Arts students may choose one of the following:

Major Only—48 hours beyond Russian 122, including Russian 201, 202, 203, 221, 222, 223, 224; 12 additional hours at the 200 level and 8 at the 300 level.

Major and Related Field—48 hours, as above, and

1. 24 hours of introductory courses and 8 hours at the 200 and 300 levels in any of the following fields: French, German, Greek, Italian, Latin, Portuguese, and Spanish or
2. 12 hours in 100-level courses and 16 hours in 200 and 300-level courses in any of the following fields: English, philosophy, speech.

Major with Prerequisite and Collateral Courses—48 hours, as above, and 36 additional hours distributed as follows:

Prerequisites: History 111, 112, 113

Collateral courses: History 223, 224, 225, 310, 396

Political Science 355

Minor—Students from other departments who wish to minor in Slavic languages may do so in two ways:

1. Those who do not satisfy the College language requirement in Slavic languages take a total of 32 hours, including Russian 101 through 122 and 8 hours on the

200 and 300 levels, chosen with the approval of the Department of Slavic Languages and Literatures.

2. Those who have competence at the level of Russian 104 or beyond take 20 hours on the 200 and 300 levels, chosen with the approval of the Department of Slavic Languages and Literatures.

Departmental Distinction: A 4.50 average in all departmental lower-division courses, and a 4.75 average in all departmental upper-division courses taken.

Teacher Education in Russian: Requirements for Teaching in Secondary Schools

Major—52 hours beyond the 100 level including:

- a. Russian 201, 202, 203, 204, 205, 206, 207, 221, 222, 223, 224, and 332,
- b. One elective from the following—Russian 215, 216, 230, Russian History 223, 224, 225, or any 4-hour Russian literature course at the 300 level;
- c. The statement of fluency in Russian issued by the department.

Minor—32 hours including:

- a. Russian 121, 122, 201, 202, 203, 204, 207, and either 230 or 332;
- b. The statement of fluency in Russian issued by the department.

Sociology

Professors: Robert L. Hall, Ph.D., Head of the Department; Robert E. Corley, Ph.D.; Peter P. Klassen, Ph.D.; Roger W. Little, Ph.D.; George J. McCall, Ph.D.; Mildred A. Schwartz, Ph.D.; Ethel Shanas, Ph.D.

Associate Professors: M. Rue Bucher, Ph.D.; James T. Carey, Ph.D.; William W. Erbe, Ph.D.; Associate Head of the Department; John W. C. Johnstone, Ph.D.; John W. Martin, Ph.D.

Assistant Professors: Pauline B. Bart, Ph.D.; Butler P. Crittenden III, Ph.D.; Kathleen Crittenden, Ph.D.; Edward P. Friedman, Ph.D.; Gerald M. Swatez, Ph.D.; Larry L. Tifft, Ph.D.; Mary G. Wiley, Ph.D.

Instructors: Janet M. Alger, M.A.; Steven F. Alger, M.A.; Brigitte M. Erbe, M.A.; Hazel S. Fisher, B.A.; Geoffrey E. Fox, A.B.; Christopher T. Husbands, M.A.; Richard J. McKinlay, M.A.; Helen R. Miller, M.A.; James L. Norr, M.A.; James L. Ross, M.A.; Philip R. Weinberger, M.A.; James A. Wiley, M.A.

Major—for the degree of Bachelor of Arts, 46 hours, including the following:

Sociology 100

Sociology 185 or Psychology 243

Sociology 262, 263

30 additional hours in sociology. At the student's option, up to 12 hours from the approved list of collateral courses in other departments may be substituted for an equal number of hours in sociology, provided the same courses are not counted toward the fulfillment of the general education requirements of the College.

Collateral courses may *not* be substituted for Sociology 100, 185, 262, or 263.

Approved collateral courses are:

Anthropology 213, 314, 317, 363
 History 373, 374, 377, 378, 379
 Mathematics 194 or 195
 Philosophy 222, 345
 Psychology 210, 215, 315, 317, 318

Departmental Distinction: A candidate must have a 4.00 all-University grade-point average, must meet all general requirements for a major in sociology, complete Sociology 287 and 288, Senior Seminar, and at least 4 hours in Sociology 299, Individual Study.

Minor—Students majoring in another department who wish to minor in sociology must complete 20 hours of sociology, of which at least 12 hours must be in courses at the 200 or 300 level.

Teacher Education in Sociology: Requirements for Teaching in Secondary Schools

Major—48 hours, including the following:

Sociology 100, 130, 185, 343

24 additional hours in sociology, of which at least 16 hours must be at the 200 or 300 level.

Anthropology 150 or 130, and 160

Minor—32 hours, including the following:

Sociology 100, 130, 185

Anthropology 160 and 130

12 additional hours in sociology at the 200 or 300 level.

The Department of Sociology strongly advises an approved teaching minor for majors in its teacher education program because sociology courses are not taught extensively in secondary schools. The completion of an approved minor qualifies the student to teach in another area.

Spanish, Italian, and Portuguese

Professors: Brian Dutton, Ph.D., Head of the Department; Audrey L. Kouvel, Ph.D.; Jose Sanchez, Ph.D.

Associate Professors: Violet E. Bergquist, M.A.; Eduardo Betoret-Paris, Ph.D.; Manuel Blanco-Gonzalez, M.A.

Assistant Professors: Lucille V. Braun, Ph.D.; James D. Compton, Ph.D.; Ruth El Saffar, Ph.D.; Isidro Lucas, Ph.D. (Visiting); Jerry R. Rank, Ph.D.; Ferdina J. Tort, M.A.

Instructors: Constance K. Adelman, M.A.; Pedro J. Algarin, M.A.; Donald Bartell, M.A.; Jose Buergo, M.A.; Judith G. Chandran, M.A.; Mark J. Cramer, M.A.; Gerald Dreller, M.A.; Lydia Z. Fernandez, M.A.; Walter J. Guevara, M.A.; Norma W. Guice, M.A.; Margherita M. Harwell, M.A.; Hernani Larisgoitia, M.A.; Franco Martinelli, M.A.; Dennis G. Nazak, M.A.; Jorge Rodriguez-Florida, M.A.; Susan M. Socolow, M.A.; Ramona Spinka, M.A.; Luciana A. Stefani, Ph.D.; Philip L. Vandrey, M.A.; Shirley Verdugo-Perez, M.A.

Lecturers: Americo Bugliani, M.A.

Assistants: Bertha I. Arias, B.A.; John F. Clark, M.A.; Rogelio Guerrero, B.A.; Rosamaria E. Limpin, B.S.; Catherine Link, B.A.; Carla Pacitti, B.A.; Ronald Perlman, B.A.; Zoryana O. Zabrosky, B.A.

Major—for the degree of Bachelor of Arts, 42 hours, exclusive of courses given in translation, including:

Spanish 218, 219, 221, 222, 223, 224

At least 6 hours of Spanish composition and conversation courses on the 200 level, chosen in consultation with a departmental adviser

At least 18 hours of 300-level courses in Spanish.

Required Collateral Courses—24 hours, to be chosen in consultation with a departmental adviser.

Departmental Distinction: The student must complete at least 18 hours in upper-division courses with an average of 4.50 to be considered for departmental distinction.

Minor—Students from other departments who wish to minor in Spanish must take a minimum of 19 hours at the 200 level or above, exclusive of courses in translation. At least 6 hours must be in the 211-216 sequence, and at least 6 additional hours must be in either 221 and 222 or 223 and 224. Courses must be chosen in consultation with the Department of Spanish.

Teacher Education in Spanish: Requirements for Teaching in Secondary Schools
Major—49 hours

Spanish 211, 212, 213, 214, 215

216, 218, 221, 222, 280

281, 331, or 332, 350, 351

352, 353

At least 5 hours in literature courses above the 200 level.

Minor—30 hours

Spanish 104, 105, 106

211, 212, 213

214, 215, 216

Speech and Theater

Professors: R. Victor Harnack, Ph.D., Head of the Department; John B. Haney, Ph.D.; Chester C. Long, Ph.D.; Carl A. Pitt, Ph.D.; Harry J. Skornia, Ph.D.

Associate Professors: Grace Holt, M.A.; Thomas M. Kochman, Ph.D.; Katharine T. Loesch, Ph.D.; Barbara S. Wood, Ph.D.

Assistant Professors: Sanford D. Horwitt, Ph.D.; Conde R. Hoskins, M.A.; Helen J. Hovde, M.A.; John A. Jones, Ph.D.; Theodore V. Kundrat, M.A.; Natalie Schmitt, Ph.D.; Dennis Sporre, M.A.

Instructors: Ann H. Armstrong, M.A.; Carol A. Berthold, M.A.; Janice M. Crews, M.A. (Emerita); Julia M. Curry, M.S.; Kathleen M. Elson, M.A.; Frances M. Goulson, M.T.A. (Emerita); Judith O'Malley, M.A.; William F. Raffeld, M.A.; Joel Sternberg, M.A.

Assistants: Ronald E. Brandt, B.A.; Madeleine M. Grigg, B.A.; Patricia A. Kelly, B.A.; Maria Robinson, B.A.; George Serlovsky, B.A.; Diane Shore, B.A.; Valerie Sparkis, B.A.

Major—for the degree of Bachelor of Arts, 44 hours exclusive of Speech 100, 101, and 141. At least 24 hours must be at the 200 or 300 level, and all major programs must include Speech 201 or 202. Majors must demonstrate proficiency in public speaking and oral reading at the Speech 101, 141 levels.

Majors elect one of three programs: *Communications and Public Address, Theater and Oral Interpretation, or Mass Media*. Consult the department office for examples of programs in these areas. Choices will be made in consultation with a departmental adviser.

Departmental Distinction: A candidate must have a cumulative grade-point average of 4.00 and a grade of B in Speech 298; with High Distinction, either a cumulative grade-point average of 4.00 and a grade of A in Speech 298 or a cumulative grade-point average of 4.25 and a grade of B in Speech 298; with Highest Distinction, a cumulative grade-point average of 4.25 and a grade of A in Speech 298.

Minor—Students from other departments who wish to minor in speech and theater take at least 28 hours, chosen in consultation with an adviser in the Department of Speech and Theater. At least 12 of the 28 must be at the 200 or 300 level.

Teacher Education in Speech: Requirements for Teaching in Secondary Schools Communications and Public Address:

Major—48 hours

Speech 101 or 102, 141, or proficiency¹

111, 112, 113

121, 122, 123, 201 or 202

211, 212, 213, 295

Minor—30 hours

Speech 101, 141, or proficiency¹

111, 112, 113, 201 or 202

211 or 212 or 213

Theater and Oral Interpretation:

Major—48 hours

101 or 102, 141, or proficiency¹

111, and 112 or 113

121, 122, 123, 151

201 or 202, 211 or 212 or 213

241, 261, 264, 295

Electives: 0-22 hours

Minor—30 hours

101, 141 or proficiency¹

121, 122, 123, 151

201 or 202, 241, 264

¹If the student demonstrates proficiency in Speech 101 and 141 (by departmental examination), additional hours must be taken to achieve the 48-hour requirement for the major and the 30-hour minimum requirement for the minor.

The Preprofessional Programs

The College offers work that prepares students to enter the following professional fields: medical dietetics, medical record administration, medical technology, dentistry, law, medicine, nursing, pharmacy, and veterinary medicine. A partial program in occupational therapy is also offered.

Meetings are arranged throughout the academic year to permit students in the preprofessional programs to discuss academic problems with representatives from the professional colleges. However, admission to a preprofessional curriculum does not guarantee admission to a professional school; nor does attainment of the minimum grade-point average for one of the curricula listed below in itself assure admission. If he is not admitted to a professional school, a student may continue to work for a baccalaureate at the University of Illinois at Chicago Circle by meeting all the graduation requirements of the College of Liberal Arts and Sciences.

Medical Dietetics—Minimum grade-point average, 3.000, and 90 quarter hours, exclusive of physical education and basic military science, distributed as follows:

	<i>Hours</i>
Rhetoric 101, 102	8
Natural sciences	50
Biological Sciences 100, 101, 102, 250	
Chemistry 112, 113, 114, 233, 234	
Mathematics 104, 105	
Social sciences	12
Economics 120	
Psychology 100	
Sociology 100	
Humanities	12
Electives	8

The third and fourth years are taken in the School of Associated Medical Sciences of the College of Medicine, which also awards the degree.

Medical Record Administration—Minimum grade-point average, 3.000, and 135 quarter hours, exclusive of physical education and basic military science, distributed as follows:

	<i>Hours</i>
Rhetoric 101, 102	8
Natural sciences	34
Biological Sciences 100, 101, 102, 133, 134	
Physical sciences (12 hours)	
Social sciences	12
Humanities	12
Electives	69
24 hours of foreign language highly recommended	

The fourth year is taken in the College of Medicine, which also awards the degree.

Medical Technology—Minimum grade-point average, 3.000, and 135 quarter hours, exclusive of physical education and basic military science, distributed as follows:

	<i>Hours</i>
Rhetoric 101, 102	8
Natural sciences	
Biological Sciences 100, 101, 102, 250, and 7 additional hours	24
Chemistry 112, 113, 114, 121, 233, 234	30
Physics 101, 102, 103*	15
Social sciences	12
Humanities	12
Electives (24 hours of foreign language highly recommended) to complete the required total of 135 hours.	

The fourth year is taken in the School of Associated Medical Sciences of the College of Medicine, which also awards the degree.

*Mathematics courses to fulfill prerequisites for physics courses (may be met by placement or by course work).

Occupational Therapy—Minimum grade-point average, 3.500.

The first year is taken in the General Curriculum of the College of Liberal Arts and Sciences. A student must be personally interviewed by the Director of the Occupational Therapy Curriculum of the School of Associated Medical Sciences, College of Medicine, University of Illinois at the Medical Center, or by a designated representative before he is admitted to the curriculum.

<i>First Year</i>	<i>Hours</i>
Art (approved courses)	6
Humanities	12
Physical sciences (approved courses)	12
Physical education	3
Recommended electives	15

The second and third years are taken on the Urbana campus; the fourth and fifth (16 calendar months) at the Medical Center. The College of Medicine awards the degree.

Pre dentistry—Minimum grade-point average, 3.250.

Students must take the Dental Aptitude Test. Application forms and details may be obtained from the Office of the College of Liberal Arts and Sciences (350 University Hall).

90 quarter hours, exclusive of physical education and basic military science, distributed as follows:

	<i>Hours</i>
Rhetoric 101, 102	8
Chemistry 112, 113, 114, 233, 234 or 117, 118, 119, 233, 234	25-28
Biological Sciences 100, 101, 102	12
Physics 101, 102	10
Electives (Physics is recommended.)	32-35

If a student wishes to receive a B.S. in Dentistry, he must have completed two years of a foreign language before he enters dental school.

Prelaw—A baccalaureate earned in a curriculum of the College of Liberal Arts and Sciences and a 3.500 grade-point average qualify a student for application to the College of Law of the University of Illinois.

Because prior education in diverse fields may prove valuable to the law student and to the graduate lawyer, schools of law have no specific requirements for the courses that comprise prelegal study. The faculty of the College of Law of the University of Illinois has prepared a pamphlet, *Education For a Career In Law*, that suggests various courses and programs that may be helpful in preparing for study of the law. It may be obtained from the College of Law, University of Illinois, Champaign, Illinois 61820. The Association of American Law Schools has also prepared *Law Study and Practice in the United States* (St. Paul, Minn.; West Publishing Company).

The education of a lawyer begins long before he enters the law school. His effective and satisfying pursuit of the profession may depend not only upon his mastery of the scope and operation of the legal system, but also upon proficiency in verbal expression, comprehension of and ability to analyze complex subjects, understanding of the physical and social worlds, ability to associate and work with others, and the disposition to accept and discharge responsibility. A law school cannot develop all these qualities in its students during three years of legal training; thus, law schools generally require substantial prelegal study as a condition for admission. Education before law school should be looked upon as a very important phase of the preparation for the legal profession; therefore the student should select his prelegal studies for maximum benefit, not with undue regard for minimum requirements.

Premedicine. The Catalog of the University of Illinois College of Medicine states the following: "Students seeking admission to the College of Medicine must:

1. Demonstrate in addition to academic achievement, the emotional maturity, the integrity, and the motivation judged necessary for the successful study and practice of medicine.
2. Have received a baccalaureate degree (ordinarily B.A. or B.S.) from a recognized college or university or be eligible to receive such a degree upon satisfactory completion of the curriculum of the first year in the

College of Medicine. Students from colleges that do not grant a degree after the satisfactory completion of the first year of medicine may be considered for admission after satisfactory completion of three years (not less than 90 semester hours) of college work if such students are eligible for full senior status (i.e., eligibility to receive a baccalaureate degree after completion of the senior year) in that college."

The undergraduate program must include as a minimum:

	<i>Hours</i>
Biological Sciences 100, 101, 102	12
Chemistry 112, 113, 114	15
Chemistry 233, 234, and 235 or 121	15
Physics 101, 102, 103	15

The College major should be in the field that the student finds most interesting. If he chooses a division of science, he should obtain the broadest experience possible in the humanities; if he chooses the humanities, he should be certain to include the minimum science requirements but not necessarily limit himself to them. The College of Medicine would expect some studies in, but not require specific sequences in English and foreign languages. Mathematics through calculus is recommended. Psychology and sociology are examples of studies that effect an understanding of human behavior and that will complement studies both in the sciences and the humanities.

Medical College Admission Test. All candidates are required to take the Medical College Admission Test recommended and approved by the Association of American Medical Colleges. The applicant must obtain a satisfactory score on this test.

Bachelor's Degree. The College of Liberal Arts and Sciences at Chicago Circle accepts a total of 48 quarter hours or 32 semester hours of credit from the first year at the University's College of Medicine to enable the student to complete the requirements for both a bachelor's degree and a medical degree in seven rather than the usual eight years. This program requires (1) that the student be in good standing in the College of Medicine; (2) that work taken in the College of Medicine does not duplicate work taken in premedical courses; (3) that the student complete the third or last year of premedical study, consisting of at least 45 quarter hours of credit at Chicago Circle or 30 semester hours of credit at Urbana; and (4) that the student meet all requirements for graduation from the College of Liberal Arts and Sciences.

The following are the College of Medicine courses accepted by the College of Liberal Arts and Sciences and the majors to which they apply:

Biochemistry 301, 302, and 303: applicable to a chemistry major or for elective credit at the upper-division level for a total of 9 quarter hours.

Physiology 301, 302, and 303: applicable to a biological sciences major or for elective credit at the upper-division level for a total of 15 quarter hours.

Histology: applicable to a biological sciences major or as elective credit at the upper-division level for a total of 12 quarter hours.

Gross anatomy: applicable to a biological sciences major or for elective credit at the upper-division level for a total of 12 quarter hours.

Prenursing—Minimum grade-point average, 3.000, and 45 quarter hours, exclusive of physical education and (for men) basic military science, distributed as follows:

	<i>Hours</i>
Rhetoric 101, 102	8
Natural sciences	18
Biological Sciences 100,101, (102 recommended)	
Chemistry 112, 132	
Social Sciences:	8
Psychology 100	
Sociology 100	
Humanities	8
Electives	3

Prepharmacy—Minimum grade-point average, 3.000; 45 quarter hours, exclusive of physical education, health science, and basic military science, distributed as follows:

	<i>Hours</i>
Rhetoric 101, 102	8
Natural sciences	23-28
Chemistry 112, 113, 114 or 117, 118, 119	
Mathematics 104, 105 or 100, 101	
Electives (foreign language, humanities, social sciences)	9-14

A student may elect to remain a second year, in which case his program will be as follows:

	<i>Hours</i>
Chemistry 233, 234, 235, 237	15
Physics 101, 102, 103	15
Mathematics 130	5
Accounting 100	3
Economics 120	4

Preveterinary Medicine—Minimum grade-point average 3.500, and 96 to 101 quarter hours, exclusive of physical education and basic military science, distributed as follows:

Rhetoric 101, 102	<i>Hours</i>
Natural sciences	8
Biological Sciences 100, 101, 102	52-57
Chemistry 112, 113, 114, 121 or 117, 118, 119 and 233, 234	
Physics 101, 102, 103	
Social sciences*	12
Humanities*	12
Foreign language	12

*Courses are selected in consultation with a college adviser.



The School of Physical Education

Sheldon L. Fordham, Ed.D., Director

Charles J. Kristufek, M.S., Assistant Director

The School of Physical Education serves a triple function—it offers a program within which the student may fulfill his physical education requirement, it offers an extracurricular program in which the student may participate in competitive and recreational experiences commensurate with his ability, and it offers a professional program in which the student majoring in physical education studies for the degree of Bachelor of Science in Physical Education.

The Required Program for Students Enrolled at Chicago Circle

Men and women entering the University with less than 90 quarter hours of credit are required to earn six quarters of credit in physical education, including any amount transferred, unless they are over thirty years of age or are veterans. The evaluated results of the preregistration medical examination are used to prescribe each student's program. Students with handicaps are assigned activities commensurate with their physical abilities. Students without handicaps are required to satisfactorily complete the following courses:

1. The foundations course.
2. One fitness-improvement course.
3. A team, dual, or individual activity in sports.
4. Three elective courses; students who do not meet fitness standards as determined by diagnostic tests are placed in suitable activities.

Any student except a physical education major may elect to take any physical education course on a pass-fail-grade basis. A student also may take a proficiency test for any activity and for the foundations course. The proficiency tests to be offered each quarter are listed in the Timetable.

Students who are placed in PEM 101 or PEW 102 by the Health Service should continue in the same program unless advised otherwise by the Health Service or the School of Physical Education.

Although veterans have fulfilled the physical education requirement and are exempt from physical education, they are encouraged to utilize the physical education facilities, as are all students in the University.

Pass-Fail Grade Option

All courses in the Men's and Women's Physical Education Required Program are offered on a pass-fail grade option, which permits the student to receive a recorded grade of pass or fail in lieu of a letter grade. During the first week of each quarter, instructors explain the pass-fail option to their students who have until the end of the third week to submit a pass-fail-option card. Instructors are not informed of which students have elected the option; they compute letter grades for all students, and the Office of Admissions and Records converts a grade of D or better to a P (pass) and a grade of E to an F (fail).

A section change does not affect the pass-fail status. However, if a change in course is made and the option is desired for the new course, the student must complete a new pass-fail-option card, regardless of his status in the previous course.

Intercollegiate and Intramural Athletics

A complete program of intercollegiate athletics, including cross country, soccer, football, ice hockey, basketball, swimming, gymnastics, wrestling, fencing, track and field, baseball, tennis, golf, and volleyball is maintained.

Over twenty activities comprise the Men's Intramural Program under the supervision of the Intramural Director.

Women's Athletic Association and Orchesis

The Women's Athletic Association offers all women students the opportunity to participate in an extramural and intramural sports program. The main objective of W.A.A. extramurals is to give the highly skilled participant an opportunity to compete against other schools. In intramurals, the Chicago Circle student, regardless of skill, is able to participate with friends strictly for the fun of the sport. By paying student activity fees, included in tuition, all women are eligible for participation in one or many of the 16 sponsored sports.

Orchesis offers opportunities for men and women to participate in a variety of dance activities such as folk and square dance, modern jazz, ballet, and modern dance forms and to work creatively in group and individual choreography and production.

The Professional Programs

Physical Education for Men

Leo L. Gedvilas, Head of the Department
Charles J. Kristufek, Supervisor of the Professional Program
Matthew H. Ellsworth, Supervisor of the Service Program

Professors: Peter R. Berrafato, M.S.; Sheldon L. Fordham, Ed.D.; John O. Jones, M.S. (Emeritus); Charles J. Kristufek, M.S.

Associate Professors: Leo L. Gedvilas, M.S.; Lester H. Miller, M.A.; Benedict W. Montcalm, M.A.; William H. Roetzheim, M.S.; Bradley L. Rothermel, Ph.D.; Walter G. Versen, M.Ed.

Assistant Professors: Robert J. Beck, M.Ed.; James C. Descourouez, Ed.M.; Matthew H. Ellsworth, Ed.M.; Harold H. Nemoto, M.A.; Lawrence B. Oskal, Ph.D.; Leon F. Pickens, M.S.; Richard R. Rader, M.S.; Thomas F. Russo, Ed.M.

Instructors: Robert W. Danner M.S.; William F. Fudala, M.A.; Frank L. Jambois, M.S.; William F. Leach, M.S.; Ralph W. Mackh, M.Ed.; Michael B. McGovern, M.S.; Steven B. Nasatir, M.A.; Thomas P. Sattler, M.S.; John B. Shea, M.S.; Paul T. Wright, Ed.M.

Assistants: Jerome I. Cohen, B.S.; Samuel J. Donnelly, Jr., B.S.; Richard R. Fahey, B.S.; Jesse Fields, B.S.; Leonard J. Gramarossa, B.S.; James E. Izral, B.S.; Edward J. McQuillan, B.S.; James A. Nasiopulos, B.S.; John Schrammel, B.S.

Freshmen who wish to enter the professional curriculum must meet the entrance requirements of the School of Physical Education. Students who transfer from another institution or from another college of the University must meet the following grade-point requirements: students with less than 90 quarter hours credit—3.30 cumulative average or higher; students with 90 quarter hours credit or more—3.50 cumulative average or higher.

For the degree of Bachelor of Science in Physical Education for Men, a minimum of 203 hours is required, distributed as follows:

<i>General Education</i> , 66 hours	<i>Hours</i>
Biological Sciences 100, 101, 102—General Biology	12
Biological Sciences 133—Human Biology I	5
Biological Sciences 134—Human Biology II	5
Rhetoric 101, 102	8
Speech 100—Principles of Effective Speaking	3
Speech 101—Effective Speaking	2
Political Science 151—American Government: Organization and Powers	4
Humanities courses	12
History 153—History of the United States from 1890	4
Psychology 100—Introduction to Psychology	4
Sociology 100—Introduction to Sociology	4
Health Science 180—Personal and Community Health	3
<i>Education</i> , 32 hours	<i>Hours</i>
Education 170—Educational Foundations	4
Education 210—The Educative Process	4
Education 230—Curriculum and Instruction in Secondary Schools	4
Education 250—Educational Evaluation	4
Education 270—Educational Practice with Seminar	16

<i>Courses in the Major, 73 hours</i>	<i>Hours</i>
PEM 170—Baseball	4
PEM 171—Basketball	4
PEM 172—Football	4
PEM 173—Gymnastics	2
PEM 174—Swimming	4
PEM 175—Track and Field Athletics	4
PEM 176—Wrestling	4
PEM 177—Fundamentals of Special Activities (Field Sports and Bowling)	2
PEM 178—Fundamentals of Special Activities (Badminton, Volleyball, and Tennis)	2
PEM 179—Handball, Archery, and Golf	2
PEM 180—Fitness Program	4
PEM 185—Introduction to Physical Education	3
PEM 188—History of Sports	4
PEM 250—Kinesiology	5
PEM 251—Physiology of Muscular Activity	4
PEM 252—Theory of Prescribed Exercise	4
PEM 253—Tests and Measurements in Physical Education	4
PEM 255—First Aid and Care and Prevention of Athletic Injuries	4
PEM 260—Organization of Physical Education Programs	3
PEM 261—Organization of Athletic Programs	3
PEM 262—Organization and Administration of Intramural Sports Programs	3

Minor and Electives, 32 hours

Additional courses are necessary to complete the required number of hours for graduation from the curriculum. Recommended electives are selected with the help of the faculty adviser.

Physical Education for Women

Helen M. Heitmann, Acting Head of the Department and Supervisor of the Professional Program in Teacher Education

Linda L. Bain, Supervisor of the Elementary Education Program

Marian E. Kneer, Supervisor of Student Teaching

Carol J. Ladwig, Supervisor of the General Education Program

Professors: Helen M. Barton, Ed.D. (Emerita); Dorothy F. Gillanders, Ph.D.

Associate Professors: Helen M. Heitmann, D.P.E.; Wilma J. Pesavento, Ph.D.

Assistant Professors: Linda L. Bain, M.S.; Mary A. DiVito, Ed.M.; Marian E. Kneer, Ed.S.; Carol J. Ladwig, M.S.; Mary E. McQuiety, M.S.; Frances E. Sweeney, M.A.

Instructors: Emily M. Axelrod, M.S.; Karen L. Beck, M.S.; Michelle Emmett, M.S.; Mary Kapsalis, M.S.; Anne K. Klinger, M.A.; Janice D. McCaleb, M.S.; Nina K. Pappas, M.S.

Assistants: Arthur W. Henderson, B.M.; Dorothy J. Hjermstad, B.A.; Dalia E. Grigaitis, B.A.; Concetta M. Licausi, M.A.; Carol A. Majeske, B.S.; N. Faye Peterson, B.S.; Ruth G. Thomas, B.S.; Erna Wachtel.

Lecturers: Denise J. Harper, M.A.

Two options are available to the student who seeks the degree of Bachelor of Science in Physical Education for Women:

Option I—For the high school teaching certificate: minimum of 196 quarter hours of credit.

Option II—For the special certificate for teaching grades 1 through 12: minimum of 195 quarter hours of credit.

Required Courses for Options I and II

General Education, 65-67 hours

	<i>Hours</i>
Rhetoric 101, 102	8
Biological Sciences 100, 101, 102—General Biology	12
Biological Sciences 133, 134—Human Biology I, II	10
Humanities	12
Mathematics	3-5
Psychology 100—Introduction to Psychology	4
Speech 100—Principles of Effective Speaking	3
Speech 101—Effective Speaking	2
Health Science 180—Personal and Community Health	3
History 152—History of the United States from the 1820's to the 1890's, or	4
History 153—History of the United States from 1890 to the Present	4

Education, 32 hours

	<i>Hours</i>
Education 170—Educational Foundations	4
Education 210—The Educational Process	4
Education 230—Curriculum and Instruction in Secondary Schools	4
Education 250—Educational Evaluation	4
Education 270—Educational Practice with Seminar	16

Courses in the Major

Activity Courses, 17 hours

	<i>Hours</i>
PEW 110, 111, 112, 113 or 115—Beginning, Advanced Beginning, Intermediate, Advanced, or Synchronized Swimming	1
PEW 152—Soccer and Speedball	1
PEW 153—Stunts, Tumbling, and Trampoline	1
PEW 154—Volleyball, Track and Field	1
PEW 155—Gymnastics and Apparatus I	1
PEW 156—Swimming II	1
PEW 157—Basketball I and Softball	1
PEW 159—Basketball II and Field Hockey	1
PEW 168—Gymnastics and Apparatus II	1
PEW 201—Archery and Golf	2
PEW 203—Badminton and Tennis	2
Dance 100—Creative Dance	1
Dance 235—Folk, Square, and Ballroom	3

Theory and Supervised Teaching Courses, 48 hours

PEW 150—Professional Orientation	3
PEW 151—Body Mechanics and Basic Movement	1
PEW 200—Teaching of Dance and Gymnastics	4
PEW 204—Supervised Teaching of Dance and Gymnastics	2
PEW 205—Tests and Measurements in Physical Education	4
PEW 213—Teaching of Sports	4
PEW 214—Supervised Teaching of Sports	1
PEW 222—Physical Education in Elementary and Secondary Schools	3
PEW 230—Kinesiology	5
PEW 250—Organization and Administration of Physical Education	4
PEW 280—History of Sports	4
PEW 281—First Aid	4
PEW 282—Organization of the School Health Program	4
PEW 283—History of Philosophy of Physical Education	4

Additional Requirements*Option I—36 hours in Minor and Electives*

Students entering Option I are required to elect a teacher education minor. The remaining hours are to be taken in electives.

*Option II**Elementary School Physical Education Activities—6 hours*

PEW 166—Elementary School Games—3

Dance 200—Dance in the Elementary School—3

Electives 25-27

Teacher Education Minor in Physical Education for Women*Courses*

	<i>Hours</i>
PEW 281, PEW 282, and PEW 283	12
PEW 213 and PEW 214	5
(or PEW 200 and PEW 204)	(6)
PEW 151, PEW 153, PEW 155	3
Dance 100	1
PEW 152, PEW 154, PEW 157 (select 2)	2
PEW 201 or PEW 203	2
PEW 110, PEW 111, or PEW 112	1
PEW 142, PEW 143, or PEW 144	1
Physical Education, health education, and dance electives	2-3

Honors

The student graduates with honors if his or her cumulative grade-point average for all university work taken at Chicago Circle is 4.0 or higher.

The Certificate of Merit is awarded to the graduating student who has maintained a minimum grade-point average of 4.75 in all physical education courses and in student teaching. Names of recipients will also be inscribed on a plaque in the Physical Education Building.



Courses of Instruction

Quarterly Timetables must be consulted for courses to be offered during a given quarter; the frequency of the offerings is determined by the departments, colleges, and schools and as program requirements dictate and staff availability permits. Assurance cannot be given that specific courses will be offered each year. Requirements stated in the department sections serve as a guide to program planning; department advisers will counsel students on individual programs within the major.

Courses are grouped alphabetically. Following the number and title of each course is a statement of credit given, content and prerequisites (if any).

Definition of a Credit Hour: A University credit hour represents one classroom hour of fifty minutes weekly for one quarter, in lecture or recitation and either the necessary preparation time or a longer time in laboratory or other exercises for which outside preparation is not required. It is expected that most students will spend two hours preparation for one hour per week of lecture or recitation. Each University quarter-hour credit is thus understood to represent at least three hours of the student's time, and the credit value of a course is calculated in quarter hours on that basis.

Courses for freshmen and sophomores are numbered 100 to 199; for juniors and seniors, 200 to 399. See the appropriate Timetable for the final course offerings for each quarter.

The letters F, W, S, and Su indicate, when used, the quarter in which the course is offered.

CC 299. The Contemporary University. 2 to 4 hours, depending on the topic covered in a given quarter. May be repeated once for credit with consent of the instructor; total credit may not exceed 4 hours. Examination of selected problems in the philosophy, organization, methodology, and governance of the University. Prerequisite: Junior standing or consent of the instructor.

ACCOUNTING (Actg)

100. Accounting I. 3 hours. Concepts and principles underlying the processing and reporting of accounting information for decision making. Prerequisite: Sophomore standing.

101. **Accounting II.** 3 hours. Internal control as it affects the processing of accounting information; relationship between assets and earnings; effects of valuation methods on income determination. Prerequisite: Actg. 100.
102. **Accounting III.** 3 hours. Managerial use of accounting information in decision making and planning; standards and budgets as a guide to measuring operating performance. Prerequisite: Actg. 101.
300. **Managerial Cost Accounting.** 4 hours. Analysis of costs for control, decision making, and planning; standards and budgets as a guide to measuring operating performance. Prerequisite: Actg. 302.
301. **Asset Valuation and Income Determination.** 4 hours. The development, applications, and limitations of accounting theory as related to the valuation of assets and measurements of income. Prerequisite: Actg. 102.
302. **Accounting for Entity Interest.** 4 hours. Accounting for rights of creditors, stockholders, and partners in a going concern; effects of expansion and contraction on equities; basic principles of fiduciary and fund accounting. Prerequisite: Actg. 301.
303. **Auditing.** 4 hours. The history, function, and theory of auditing; nature of the necessary evidence for the accountant's professional opinion concerning a financial position and the results of enterprise operations; applications of statistical sampling; auditing computerized systems. Prerequisite: Actg. 302.
304. **Federal Income Tax.** 4 hours. Concepts of federal income tax; its effects on decisions of corporations, partnerships, individuals, and trusts. Prerequisite: Actg. 300 or consent of the instructor.
305. **Planning and Control.** 4 hours. The budget as a formal plan of action; the effect of decision making, forecasting, and uncertainty on the determination of enterprise goals; guidance techniques for the accomplishment of the planned objectives of a firm. Prerequisite: Actg. 300.
306. **Readings and Advanced Problems.** 4 hours. Consolidated statements, foreign subsidiaries, insurance, estates, theory, general statements. Prerequisite: Actg. 302.

ADMINISTRATION OF CRIMINAL JUSTICE (CrJ)

101. **Administration of Criminal Justice.** 4 hours. The development and contemporary operation of the agencies of criminal justice, from police procedures through the prosecution and judiciary, to correctional institutions, including probation and parole. Emphasis is on current philosophies and practices.
102. **Foundations of Criminal Justice.** 4 hours. The development of law as a means of social control, from earliest records through Hammurabi, the Greek and Roman civilizations, European cultures, Anglo-Saxon Britain, the common law, to the present constitutional, statutory, and case law controls in the United States.

103. **The Development of Police Systems in Society.** 4 hours. The historical development of law enforcement, from earliest beginnings through Anglo-Saxon England to the present systems and operations. Comparative study of the theories and operations of police systems throughout the world. The structure and interrelationships of American police agencies on the federal, state, county, and municipal levels.
205. **Research Issues and Procedures in Criminal Justice.** 4 hours. Acquaints the criminal justice major with important research works in the field of criminology. Such works are selected to illustrate how problems are conceptualized, data collected, processed, and analyzed. Prerequisites: Soc. 185 and Psch. 243.
210. **Criminalistics.** 4 hours. Operations undertaken in a crime laboratory to examine and evaluate evidence in criminal and civil investigations; firearms and tool identification, drug and narcotics analyses, serology, microscopy of trace materials, and forensic instrumental analyses. Prerequisites: CrJ. 259 or consent of the instructor.
211. **Introductory Criminalistics Analysis Laboratory.** 5 hours. Introduction to laboratory analysis as applied to basic concepts of identification and individualization of common frequently occurring physical evidence materials. Criteria for the opinion formulation process. Prerequisites: Chem. 121, 134, Phys. 102, and Psch. 243; or consent of the instructor.
212. **Forensic Science.** 4 hours. Introduction to the diverse fields of forensic science: pathology, toxicology, criminal psychology, detection of deception, and document examination; role of the sciences in the administration of criminal justice; examination of the current approaches to the identification of criminal homicide. Prerequisite: CrJ. 210 or consent of the instructor.
220. **Information and Communication Systems.** 4 hours. Review of the available technology in the communication and information fields; assessment of the introduction and application of scientific "hardware" and "software" to the administration of criminal justice at all levels. Historical development of communication and information systems in law enforcement. Prerequisite: CrJ. 258, or consent of the instructor.
231. **Criminology.** 4 hours. Same as Sociology 231. The nature and extent of crime in American society; assessment and evaluation of the various factors and influences that lead to criminal behavior; various measures proposed for the control of criminal behavior. Prerequisite: 8 hours of sociology.
232. **Juvenile Delinquency.** 4 hours. Same as Sociology 232. Various conceptions of the nature of juvenile delinquency and its causes; the juvenile-court movement; juvenile detention, treatment of juvenile offenders; delinquency control programs. Prerequisite: CrJ. 231.
258. **Police Administration.** 4 hours. The principles of administration and management in their application to law enforcement; a study of the police organizational structure. Responsibilities and interrelationships of administrative and line-and-

staff services. An analysis of the functional divisions of a modern police operation in its application to public-safety needs of the community. Prerequisites: CrJ. 101 and 102 or consent of the instructor.

259. **Principles of Criminal Investigation. 4 hours.** Theory and practice of investigation; the possible applications of the philosophical principles of deductive and inductive reasoning to criminal investigation. The scientific fact-finding approach in development and practice of criminal investigation in the field of law enforcement. Prerequisite: CrJ. 101 or consent of the instructor.
280. **Theories of Sanctions, Deterrents, and Rehabilitation. 4 hours.** Analytical examination of the historical philosophies and practices of sanctions for criminal acts. Evaluation of modern approaches to the disposition of offenders, including sentencing, capital punishment, incarceration, fines, and rehabilitation programs. Prerequisite: Junior standing or consent of the instructor.
314. **Forensic Instrument Laboratory I. 5 hours.** Theory and procedures of separation, purification, and identification of components of forensic interest; extension of concepts introduced in Administration of Criminal Justice 211 and 212. Various methods, such as chromatography, solvent systems, and electrophoresis are discussed. Prerequisite: CrJ. 211 or consent of the instructor.
315. **Forensic Instrument Laboratory II. 5 hours.** Advanced instrumental analytical procedures applied to such substances of forensic interest as physiological fluids, polymeric compounds, and pharmaceuticals. Instruments treated may include pyrolysis GLC, UV-IR spectrometer, atomic absorption, and differential thermal analysis. Prerequisites: CrJ. 211 and 314 or consent of the instructor.
335. **Organized Crime in the United States. 4 hours.** The development of organized crime throughout history; detailed consideration of the political, social, and economic conditions involved in the appearance, spread, and expansion of organized crime in America. Prerequisites: CrJ. 101, 102, 231, and Soc. 225, 276; or consent of the instructor.
339. **Institutional Treatment of Offenders. 4 hours.** The role of the custodial and correctional institutions in the treatment of the offender; philosophy of administration and management of institutions; survey of historical development and current trends in jails and prisons. Prerequisites: CrJ. 101 and 102, Soc. 225 and 276; or consent of the instructor.
345. **Community Treatment of Offenders. 4 hours.** The history and development of programs relating to community treatment of offenders; examination of the philosophies and programs dealing with the rehabilitation and reintegration of the offender into society. Prerequisites: CrJ. 101 and 102, Soc. 225 and 276; or consent of the instructor.
350. **The Role of Law Enforcement in Community Relations. 4 hours.** Analysis of the relationship between law enforcement and the social structure of the community, including an examination of the significant problem areas involving minority elements, cultural and ethnic groups, power and social-elite and political and

social-action movements. Prerequisites: CrJ. 101 and 102, Soc. 225 and 276, PolS. 205; or consent of the instructor.

351. **Criminal Law I: Substantive Criminal Law.** 4 hours. Required in the curriculum in the administration of criminal justice; cannot be substituted for a criminal law course taken by law students. General doctrines of criminal liability in the United States; classification of crimes as against persons, property, and the public welfare. Emphasis on the concept of governmental sanctions of the conduct of the individual. Prerequisites: CrJ. 101 and 102, Soc. 225 and 276, or consent of the instructor.
352. **Criminal Law II: Criminal Procedure.** 4 hours. Required in the curriculum in the administration of criminal justice; cannot be substituted for a criminal law course taken by law students. The criminal process. Legal problems associated with the investigation of crime, the acquisition of evidence, the beginning of a criminal proceeding, the prosecution and defense of charges, sentencing and appeal. Principal concern is with the development of existing procedures and examination of current efforts for reform. Prerequisite: CrJ. 351 or consent of the instructor.
353. **Criminal Law III: The Instrumentalities of Criminal Justice.** 3 hours. Required in the curriculum in the administration of criminal justice, cannot be substituted for a criminal law course taken by law students. Continues Criminal Justice 352. Examination of the agencies which play significant roles in the criminal process. Functions of the law enforcement agency, counsel, and the courts. Particular emphasis on the responsibilities and interrelationships of the agencies examined. Prerequisite: CrJ. 352 or consent of the instructor.
354. **Evidence.** 4 hours. The rules of evidence as they apply to judicial proceedings and administrative hearings relative to the criminal process. Development of the underlying rationale of the rules. Emphasis on the relationship between methods of evidence collection and admissibility. Prerequisite: CrJ. 353 or consent of the instructor.
360. **Industrial and Commercial Security Administration.** 4 hours. Theories and philosophy of the administration of industrial and commercial security functions; survey of contemporary organization and management of security operations; application of law enforcement principles within private enterprise. Prerequisites: CrJ. 103, 258 and 259; or consent of the instructor.
391. **Proseminar in Criminal Justice.** 4 hours. Study in depth of current issues, problems, and developments of serious concern within the field of the administration of criminal justice. Prerequisites: CrJ. 101, 102, Soc. 225, 276, PolS. 205, and senior standing or consent of the instructor.
398. **The Problem of Justice** 4 hours. Same as Political Science 398. The premodern view of justice, such as Plato's or Aristotle's; the modern understanding of justice, such as Hobbes' or Locke's, which is the foundation of the modern political regime; Rousseau's seminal political thought on justice which is the basis of a variety of reforms and alternatives offered to Hobbes' and/or Locke's political regime. Prerequisite: Two courses in political science including PolS. 151.

399. **Independent Study.** 4 hours. For administration of criminal justice majors only. Independent study and research, under the direct supervision of a faculty member, on a subject or subjects not covered in the regular curriculum. Prerequisites: Consent of the instructor by preregistration in the Curriculum Office, Soc. 225, 276, PolS. 205 and at least five criminal justice courses, including CrJ. 101 and 102.

ANTHROPOLOGY (Anth)

130. **Introduction to Physical Anthropology.** 4 hours. Required for anthropology majors. Human origins and developments; emphasis on fossil man and races. F, W, S
133. **Human Biology I.** 5 hours. Same as Biological Sciences 133. Survey of the structure and functions of the human body; interrelationships of the various organs and systems. Lecture, laboratory. Prerequisite: 1 year of biological sciences or consent of the instructor.
134. **Human Biology II.** 5 hours. Same as Biological Sciences 134. The morphology and physiology of the human body; emphasis on the interrelationships of the various organs and systems. Three lectures and 6 hours of laboratory per week. Prerequisite: Anth. 133.
150. **Introduction to Archaeology.** 4 hours. Required for anthropology majors. General survey of world archaeology; special reference to the origins and development of Old World cultures. F, W, S
160. **Introduction to Social Anthropology.** 4 hours. Required for anthropology majors. Survey of selected cultures of the world; emphasis on the concepts and methods of ethnology and social anthropology. F, W, S
200. **Social and Cultural Theory.** 4 hours. Required for anthropology majors. Theoretical approaches to the study of culture and society in terms of structure, function, and process. Prerequisite: Anth. 160 or consent of the instructor. F
201. **Folklore.** 4 hours. Examination of the genres of oral tradition; special attention to the folklore of nonliterate societies. Emphasis on problems of origins, modes of transmission, structure, and functions of folklore. Prerequisite: Anth. 160 or consent of the instructor.
213. **Kinship and Social Structure.** 4 hours. Required for anthropology majors. Introduction to the study of social systems, with particular reference to kinship systems, lineage organizations, and collateral groupings as they structure social organization in primitive societies. Prerequisite: Anth. 160 or consent of the instructor. F, S
215. **Dynamics of Culture.** 4 hours. Introduction to the study of culture change, including the concepts of acculturation, culture contact, and diffusion. Prerequisite: Anth. 160 or consent of the instructor.

219. **Language and Culture.** 4 hours. Language as an aspect of culture, the influence of culture on language, and the cultural role of semantic ambiguity. Attention is given to the problems of language in ethnographic field research and to problems of translation between cultures. Prerequisite: Anth. 160 or consent of the instructor.
220. **Culture and Personality.** 4 hours. Introduction to the concepts, theories, and techniques of studies relating the psychology of the individual to his culture and the results of some of these studies in selected nonliterate societies. Prerequisite: Anth. 160 or an introductory course in psychology or consent of the instructor.
225. **Non-Western Religions.** 4 hours. Exploration of the varieties of religious experience, including magic and witchcraft; the roles of priesthood, prayers, scriptures, and ceremonials in social integration; the nature of sectarian movements. Prerequisite: 4 hours of either anthropology, psychology, or sociology or consent of the instructor.
230. **Bio-Anthropology.** 4 hours. The major principles of physical anthropology: human evolution, anthropometry, and functional anatomy; genetics and race; growth and constitution. Prerequisite: Anth. 130 and one year of biological sciences.
231. **Principles of Human Evolution.** 4 hours. Required for anthropology majors. The early and current theories prevalent in physical anthropology and the significance of these theories in contemporary research in biological anthropology. Prerequisites: Anth. 130 and BioS. 100, 101, and 102 or consent of the instructor. W
235. **Biology and Evolution of Human Behavior.** 4 hours. Same as Biological Sciences 235. Comparative behavior of human and nonhuman primates; biological bases of primate behavior in terms of general evolutionary trends. Critical review of the analytic methodology of the behavioral sciences. Prerequisites: One year of biological sciences and Anth. 130, or consent of the instructor.
245. **Theory in Archaeology.** 4 hours. Required for anthropology majors. Analysis of the methods and objectives of archaeology in the setting of behavioral science. Emphasis on current trends in prehistoric archaeology. Prerequisite: Anth. 150. W
250. **Old World Archaeology I.** 4 hours. The evolution of the Old World hunting/collecting cultures to the end of the Pleistocene. Prerequisite: Anth. 150.
251. **Old World Archaeology II.** 4 hours. Introduction to the prehistoric cultures of the Old World, the post-Pleistocene hunting/collecting cultures and the Stone Age farming cultures. Prerequisite: Anth. 150.
252. **New World Archaeology I.** 4 hours. Introduction to the prehistoric cultures of the New World from the populating of the Americas to the beginning of the formative cultural period in the Americas. Prerequisite: Anth. 150.
253. **New World Archaeology II.** 4 hours. Introduction to the prehistoric cultures of the New World from the formative cultural period to the high civilizations of Mesoamerica and South America. Prerequisite: Anth. 152.

255. **Field Methods of Archaeology.** 6 to 12 hours. Supervised participation in field research. Techniques and procedures are discussed and practiced under actual field conditions at an off-campus location. Prerequisites: Anth. 150 and consent of the instructor.
261. **Ethnography of Mesoamerica.** 4 hours. Preconquest civilization of Mesoamerica, the interaction of Spanish and indigenous cultures, and the present Indian cultures of this area. Prerequisite: Anth. 160 or consent of the instructor.
263. **Ethnography of Africa.** 4 hours. A survey of the culture areas of sub-Saharan Africa and study, in the ethnographic present, of societies typical of each culture area. Prerequisite: Anth. 160 or consent of the instructor.
264. **Ethnography of North America.** 4 hours. A survey of the indigenous cultures of the Indians of North America, including some studies in culture contact. Prerequisite: Anth. 160 or consent of the instructor.
265. **Ethnography of South America.** 4 hours. A survey of the indigenous cultures in South America in the ethnographic present. Prerequisite: Anth. 160 or consent of the instructor.
267. **Ethnography of the Philippines.** 4 hours. A survey of selected indigenous cultures of the Philippine Islands; emphasis on subsistence patterns and social organization. Prerequisite: Anth. 160.
280. **Introduction to Anthropological Linguistics.** 4 hours. Required for anthropology majors. The concepts and techniques of anthropological linguistics with emphasis on its significance in the study of culture and society. Prerequisite: Anth. 160 or consent of the instructor. S
295. **Seminar in Anthropology.** 2 to 4 hours. May be repeated for a total of 8 hours of credit. Reading, study, and discussion of selected problems in anthropology, for majors in anthropology; open, with the approval of the department, to seniors minoring in anthropology. Prerequisites: Junior standing and a major in anthropology, or a minor in anthropology and approval of the department.
299. **Honors Course.** 4 hours. May be repeated for an additional 4 hours of credit. Individual study or research projects. Prerequisites: Senior standing, anthropology major, and a 4.00 all-University average or consent of the instructor.
310. **Peasant Societies.** 4 hours. Research and reading in the comparative study of peasant societies in diverse regions of the world; special emphasis, during lecture and discussion, on a critical review of the anthropological literature delineating a peasant stratum of social organization and defining its characteristics. Prerequisites: Junior standing and 8 hours of social anthropology, or 8 hours of sociology, and consent of the instructor.
311. **Cultural Problems in Urbanization.** 4 hours. The processes of urbanization and of cultural and societal adjustments to urban life; case studies illustrate the variety of adjustments to urban life. Prerequisite: Anth. 213 or consent of the instructor.

314. **Kinship, Family, and Household.** 4 hours. Comparative study of the institutions of marriage, family, and household; the extension of kinship norms and values to other aspects of culture and society. Prerequisite: Anth. 213 or consent of the instructor.
315. **Comparative Religious Movements.** 4 hours. Analysis of religious behavior; special reference to the emergence of messianic cults in Africa and Melanesia and among the North American Indians and New World Negroes. Prerequisites: Junior standing and 8 hours of social anthropology, or 8 hours of sociology, and consent of the instructor.
316. **Economic Life of Primitive Peoples.** 4 hours. Patterns of production, distribution, and consumption in non-Western cultures. Cultural variation in attitudes toward labor, concepts of property, and prestige and wealth. Prerequisite: 8 hours of social anthropology; for non-majors, junior standing and consent of the instructor.
317. **The Cross-Cultural Study of Social Control.** 4 hours. Cultural-jural structures in non-Western societies; modes of dispute settlement, nature and range of sanctions, and processes of social control. Prerequisites: Junior standing and 8 hours of social anthropology or 8 hours of sociology and consent of the instructor.
321. **Cultural Evolution.** 4 hours. Critical review of theories; examination of ethnographic materials and data on cultural change and cultural contact for the purpose of examining the mechanisms of change. Prerequisite: Anth. 200 or consent of the instructor.
322. **Comparative Methods in Social Anthropology.** 4 hours. Introduction to the several kinds of comparative method, including field work, and small-sample and large-sample studies. Prerequisites: Anth. 213 and Soc. 185 or the equivalents or consent of the instructor.
327. **Primitive Political Systems.** 4 hours. Examination of data and theory pertinent to non-Western political systems; a cross-cultural study of political behavior. Prerequisites: Anth. 213 and junior or senior standing or consent of the instructor.
331. **Human Evolution.** 4 hours. Same as Biological Sciences 331. Phylogeny of the primate order and the problems of speciation; particular emphasis on the relative roles of culture and nature as selective forces in human evolution. Prerequisite: Anth. 230 or 231, or BioS. 282 or 318.
350. **Prehistoric Archaeology.** 4 hours. Archaeological field techniques and principles of the study of prehistory. Case studies from selected areas of the Old and New Worlds. Prerequisite: Anth. 251 or 253.
351. **Prehistory of the Near East.** 4 hours. Consideration of southwestern Asia and northeastern Africa as the core area in which the first civilization emerged. Emphasis on the late Quaternary to about 5000 B.C., with regard to the interrelationships between changing environment, human ecology, and cultural evolution. Prerequisite: Anth. 251, or consent of the instructor for qualified students from other departments.

352. **Early Civilization of the Old World.** 4 hours. Early civilization and incipient urbanization in Eurasia and Africa, focusing on the development of urban centers and archaic states; attention to preconditioning factors in the post-Pleistocene, Mesolithic, and Neolithic Ages. Prerequisite: Anth. 251 or 351.
355. **Field Problems in Archaeology.** 6 to 12 hours. Application of advanced techniques to the solution of special problems of archaeological field investigations; laboratory analysis under actual field conditions at an off-campus location. Prerequisites: Anth. 253 or 255 or concurrent registration in Anth. 255 and consent of the instructor.
361. **Problems in Mesoamerican Ethnology.** 4 hours. Intensive investigation of selected problems from the Mesoamerican area; special emphasis on religion, economics, and social organization. Prerequisites: Anth. 261 and reading knowledge of Spanish or consent of the instructor.
362. **Problems in African Ethnology.** 4 hours. Survey of the indigenous cultures of Africa; native cultures as reconstructed coterminous with their early historical contacts with the Western world; some additional data on present-day African cultures. Prerequisites: Junior standing and Anth. 263, or consent of the instructor.
363. **Urban Cultures of Africa.** 4 hours. The indigenous urban centers of sub-Saharan Africa and the multicultural and multiracial metropolitan areas of colonial and contemporary Africa; special reference to the processes of segregation and detribalization. Prerequisite: Anth. 263 or 362 or consent of the instructor.
364. **Problems in North American Ethnology.** 4 hours. Intensive reading and research focusing on special problems of religious, economic, and social systems of New World native peoples. Prerequisite: Anth. 264 or consent of the instructor.
365. **Problems in Pacific Ethnology.** 4 hours. Ethnological survey of the indigenous peoples of Micronesia, Polynesia, Melanesia, and Australia; special emphasis on the social, economic, and religious life of representative groups. Prerequisites: Junior standing and 8 hours of social anthropology or consent of the instructor.
368. **Problems in European Ethnology.** 4 hours. Advanced reading and research in the ethnology of rural Europe; study in depth of selected case materials. Emphasis on community structure, kinship, religious and economic systems, and methods of social control; research techniques and the nature of source materials. Prerequisite: Anth. 213.
380. **Problems in Linguistic Analysis.** 4 hours. Same as Linguistics 380. Examination of the methods and techniques used in linguistics, with reference to actual language data; emphasis on anthropological applications. Prerequisite: Anth. 280 or Ling. 315 or consent of the instructor.
399. **Independent Study.** 2 to 12 hours. May be repeated for credit. Independent study under the supervision of a staff member. Prerequisites: Junior standing and approval of the department. F, W, S

ARCHITECTURE (Arch)

101. **Architectural Design I.** 6 hours. Architectural design problems; emphasis on the development and organization of space. Prerequisite: A & A 104.
102. **Architectural Design II.** 6 hours. Architectural design problems; emphasis on structure. Prerequisite: Arch. 101.
111. **Building Technology I.** 4 hours. Wood and masonry construction and allied materials. Prerequisite: Concurrent registration in Arch. 102.
121. **Statics and Strength of Materials I.** 3 hours. Equilibrium of bodies and systems subjected to parallel, colinear, parallel noncolinear, perpendicular, and general systems of concentrated forces. Distributed bonds, centroids, buoyancy, friction. Prerequisite: Math. 112.
122. **Statics and Strength of Materials II.** 3 hours. Stresses and strains in tension and compression; moment of inertia; torsion; bending; shear and moment diagrams; stresses in beam; combined bending and aerial load. Prerequisite: Arch. 121.
123. **Statics and Strength of Materials III.** 3 hours. Deflection of beams; statical indeterminacy; columns variation of stress and strain at a point; ultimate load, failure and safety. Prerequisite: Arch. 122.
200. **Communication Skills.** 5 hours. Nonverbal communication of simple and complex ideas and concepts of the structure and systems of man-made environment. Prerequisite: Junior standing, architecture students only.
201. **Architectural Design III.** 6 hours. Architectural design problems; emphasis on environment control. Prerequisite: Arch. 102.
202. **Architectural Design IV.** 6 hours. Comprehensive design problem incorporating site planning. Prerequisite: Arch. 201.
203. **Architectural Design V.** 6 hours. Comprehensive design problems. Prerequisite: Arch. 202.
204. **Architectural Design Problems.** 6 hours. Comprehensive design problems. Prerequisite: Arch. 203.
211. **Building Technology II.** 4 hours. Steel construction and allied materials. Prerequisite: Arch. 111.
212. **Building Technology III.** 4 hours. Concrete materials and allied construction. Prerequisite: Arch. 211.
213. **Building Technology IV.** 4 hours. Electricity, illumination, and acoustics. Prerequisite: Arch. 212.
214. **Building Technology V.** 4 hours. Mechanical equipment, sanitation, heating and air conditioning. Prerequisite: Arch. 213.

215. **Building Technology VI.** 4 hours. Comprehensive architectural problems. Prerequisites: Arch. 214 and concurrent registration in Arch. 204.
221. **Structural Engineering I.** 3 hours. Loads on buildings. Algebraic and graphical analysis of beams and trusses. Sloping beams. Statically determinate space structures. Cable systems. Prerequisite: Arch. 123.
222. **Structural Engineering II.** 3 hours. Approximate analysis of frames. Moment distribution method. Energy principles. Model analysis. Prerequisite: Arch. 221.
223. **Structural Engineering III.** 3 hours. Foundation types and design. Design of masonry and timber structures. Prerequisite: Arch. 221.
224. **Structural Engineering IV.** 3 hours. Steel structures; properties of steel, design of tension members; columns; beams and connections. Design of steel buildings; roof trusses and rigid frames. Prerequisite: Arch. 222.
225. **Structural Engineering V.** 3 hours. Concrete structures; properties of concrete and steel; design of columns, beams, slabs, two-way slabs, flat slabs, walls and foundations. Prerequisite: Arch. 222.
226. **Structural Engineering VI.** 3 hours. General problems in the selection and design of structural systems for buildings; structural design with aluminum, plastics, and other materials; elements of prestressed concrete; ultimate and plastic design; unconventional structural types. Prerequisites: Arch. 223, 224, and 225.
241. **Urban and Regional Planning I.** 3 hours. Man's efforts to shape the physical environment of his community. Contemporary methods of controlling urban development. Prerequisites: For architecture students, Soc. 100 or equivalent and Soc. 276; for other students, Soc. 100.
242. **Urban and Regional Planning II.** 3 hours. Historical perspective. Prerequisite: Arch. 241.
301. **Architectural Design VII.** 6 hours. Comprehensive architectural problems. Prerequisite: Arch. 204.
302. **Architectural Design VIII.** 6 hours. Comprehensive architectural design problems. Prerequisite: Arch. 301.
309. **Architectural Design Thesis.** 6, 9, or 12 hours. May be repeated for a total of 18 hours. Individual problems in architectural design. Prerequisite: Arch. 301.
311. **Forensic Architecture.** 3 hours. Legal problems in architecture. Prerequisite: Fifth year standing.
312. **Computer Applications in Architecture.** 3 hours. The use of electronic computers in building design and construction. Prerequisite: Math. 194 or 195.

313. **Building Construction Systems.** 6 hours. Static and dynamic environmental control systems. Prerequisites: Arch. 204 and 215.
314. **Industrialized Building.** 3 hours. Prefabrication of building components. Prerequisite: Fifth year standing.
315. **Logistics of Building Construction.** 3 hours. Problems encountered in the logistics of building construction.
316. **Environmental Control Systems.** 6 hours. Problems of color, illumination, heating and air conditioning systems, and acoustics. Prerequisite: Arch. 313.
319. **Building Technology Thesis.** 6, 9, or 12 hours. May be repeated for a total of 18 hours. Individual problems in building technology. Prerequisite: Arch. 313.
321. **Foundations.** 3 hours. Elements of soil mechanics; the selection and design of pile, caisson, raft, and other foundations. Prerequisite: Arch. 226.
322. **Structural Seminar I.** 3 hours. Selected topics in structural analysis and design. Prerequisite: Arch. 226.
323. **Intermediate Structural Analysis.** 6 hours. The analysis of statically indeterminate coplanar and space structures. Prerequisite: Arch. 226.
324. **Structural Dynamics.** 3 hours. Vibration, wind, and earthquake analysis and design of buildings. Prerequisite: Consent of the instructor.
325. **Structural Seminar II.** 3 hours. Continues Architecture 322. Prerequisite: Arch. 226.
326. **Intermediate Structural Design.** 6 hours. Plastic and limit methods of design, ultimate strength design, design of prestressed concrete members and structures. Prerequisite: Arch. 226.
329. **Structural Thesis.** 12 hours. Individual problems in structures. Prerequisite: Arch. 226.
331. **Architecture Seminar.** 3 hours. May be repeated for a total of 9 hours. Current problems in architecture. Prerequisite: Fourth year standing.
332. **Architecture Reading Course.** 3 hours. May be repeated for a total of 9 hours. Individually planned readings on selected topics under supervision of a faculty member. Prior to registration the student should be advised by the instructor. Prerequisite: Fourth year standing.

ARCHITECTURE AND ART (A&A)

101. **Basic Design I.** 3 hours. Same as Art-Design 101. The basic factors in two-dimensional and three-dimensional design. Students must register concurrently in Archi-

ecture and Art 111. Exceptions to this must be approved by the head of the department.

102. **Basic Design II.** 3 hours. Same as Art-Design 102. More complex systems of two-dimensional and three-dimensional design. Introduction to color theory. Prerequisite: A & A 101.
103. **Basic Design III.** 3 hours. Same as Art-Design 103. Theory and application; form and structure; three-dimensional models of systems. Prerequisite: A & A 102.
104. **Basic Design IV.** 3 hours. Same as Art-Design 104. Form-movement-light-time in the form of machines or sculpture. Prerequisite: A & A 103.
105. **Basic Design V.** 3 hours. Same as Art-Design 105. Kinetic development of form, space, time, and movement devices. Prerequisite: A & A 104.
106. **Basic Design VI.** 3 hours. Same as Art-Design 106. A sustained project involving the application of principles studied in Architecture and Art 104 and 105, with experimentation in various media. Prerequisite: A & A 105.
111. **Visual Communications I.** 2 hours. Same as Art-Design 111. Introduction to the techniques. Students must register concurrently in Architecture and Art 101. Exceptions to this must be approved by the head of the department.
112. **Visual Communications II.** 2 hours. Same as Art-Design 112. Continues Architecture and Art 111. Prerequisite: A & A 111.
113. **Visual Communications III.** 2 hours. Same as Art-Design 113. Symbolic systems, image forming, and typography. Prerequisite: A & A 112.
114. **Visual Communications IV.** 2 hours. Same as Art-Design 114. Experimentation with the techniques and materials, including photography, used in two-dimensional expression. Prerequisite: A & A 113.
115. **Visual Communications V.** 2 hours. Same as Art-Design 115. Communications of events or visual ideas in photography or cinematography. Prerequisite: A & A 114.
116. **Visual Communications VI.** 2 hours. Same as Art-Design 116. Creative project involving application of ideas and techniques studied in Architecture and Art 114 and 115. Prerequisite: A & A 115.
141. **Man and Environment.** 3 hours. Same as Art-Design 141. Introduction to the nature of the professions of architecture and art in terms of the subjective and objective factors of architectural activity.

ART (Art)

100. **Art Today.** 4 hours. Architecture, painting, sculpture, film-photo, TV, mass media, and related areas; the forces that generated the new visual experience.

101. **The Film as a Visual Art.** 4 hours. Growth and development of the film as an art form from the silent film to the present. The effect of film on visual attitudes and its relationship to other visual media, such as painting, communication design, and television.
102. **Principles of Art.** 4 hours. For students not majoring in the art program. Introduction to the principles and techniques of two- and three-dimensional organization.
103. **Art in a Technological Society.** 4 hours. The influence of technology on art and the impact of the resultant forms on society.
104. **Drawing Techniques.** 4 hours. Open to all students. Introduction to the fundamentals of drawing.
204. **Art for Elementary Teachers: Studies in Creativity.** 4 hours. Opportunity for the elementary education major to understand the creative process through this experience in art. Prerequisites: Junior standing and Ed. 170.

ART-DESIGN (AD)

101. **Basic Design I.** 3 hours. Same as Architecture and Art 101. Students must register concurrently in Art-Design 111. Exceptions to this must be approved by the head of the department. Basic factors in two-dimensional and three-dimensional design.
102. **Basic Design II.** 3 hours. Same as Architecture and Art 102. More complex systems of two-dimensional and three-dimensional design. Introduction to color theory. Prerequisite: AD 101.
103. **Basic Design III.** 3 hours. Same as Architecture and Art 103. Theory and application; form and structure, three-dimensional models of systems. Prerequisite: AD 102.
104. **Basic Design IV.** 3 hours. Same as Architecture and Art 104. Form-movement-time in the form of machines or sculpture. Prerequisite: AD 103.
105. **Basic Design V.** 3 hours. Same as Architecture and Art 105. Kinetic development of form, space, time, and movement devices. Prerequisite: AD 104.
106. **Basic Design VI.** 3 hours. Same as Architecture and Art 106. A sustained project involving the application of principles studied in Art-Design 104 and 105, with experimentation in various media. Prerequisite: AD 105.
111. **Visual Communications I.** 2 hours. Same as Architecture and Art 111. Students must register concurrently in Art-Design 101. Exceptions to this must be approved by the head of the department. Introduction to the techniques.
112. **Visual Communications II.** 2 hours. Same as Architecture and Art 112. Continues Art-Design 111. Prerequisite: AD 111.

113. **Visual Communications III.** 2 hours. Same as Architecture and Art 113. Symbolic systems, image forming, and typography. Prerequisite: AD 122.
114. **Visual Communications IV.** 2 hours. Same as Architecture and Art 114. Experimentation with the techniques and materials, including photography, used in two-dimensional expression. Prerequisite: AD 113.
115. **Visual Communications V.** 2 hours. Same as Architecture and Art 115. Communication of events or visual ideas in photography or cinematography. Prerequisite: AD 114.
116. **Visual Communications VI.** 2 hours. Same as Architecture and Art 116. Creative project involving application of ideas and techniques studied in Art-Design 114 and 115. Prerequisite: AD 115.
141. **Man and Environment.** 3 hours. Same as Architecture and Art 141. Introduction to the nature of the professions of architecture and art in terms of the subjective and objective factors of architectural activity.
200. **Basic Design VII.** 6 hours. Open only to transfer students with art credit. A special course in three-dimensional concepts and exercises adapted to the individual needs of art transfer students. Individualized evaluation and advisement. Prerequisite: Approval of the department.
201. **Visual Communications VII.** 6 hours. Open only to transfer students with art credit. A special course in two-dimensional concepts and exercises adapted to the individual needs of art transfer students. Individualized evaluation and advisement. Prerequisite: Approval of the department.
202. **Communications Design I.** 4 hours. Theory and application of the elements of communications design through experiments with image, letter, form, and illustration. Prerequisite: Completion of the foundation program.
203. **Communications Design II.** 4 hours. Inventive exploration of applications of illustrative techniques combining work and image, collage, and imprinting. Prerequisite: AD 202.
204. **Communications Design III.** 4 hours. Free and controlled manipulation of symbol, type, drawing, and photoimage from the two-dimensional plane to volume. Prerequisite: AD 203.
205. **Communications Design IV.** 4 hours. A comprehensive investigation of the elements and interrelations of communications design, demonstrated by research and analysis. Prerequisite: AD 204.
206. **Communications Design V.** 4 hours. Theory and application of the elements of typography. Prerequisite: AD 205.
212. **Industrial Design I.** 4 hours. An experimental approach to the utilization of functional structures, i.e., for support and suspension in tension and compression.

Application of the foregoing principles to functional design. Prerequisite: Completion of the foundation program.

213. **Industrial Design II. 4 hours.** Studies of two-dimensional and three-dimensional presentations, sequential analysis, photo recording, charts, diagrams, drawings, and other visual materials. Prerequisite: AD 212.
214. **Industrial Design III. 4 hours.** Systematic two-dimensional and three-dimensional investigation of communication elements as they relate to design and planning for display and exhibition design. Prerequisite: AD 213.
215. **Industrial Design IV. 4 hours.** Analysis and planning preliminary to comprehensive projects involving the development of solutions to problems of production, logistics, and the like. Prerequisite: AD 214.
216. **Industrial Design V. 4 hours.** Projects developed from forming concepts. Natural and synthetic materials; heat, chemical, and mechanical processes. Prototyping techniques and material investigation. Prerequisite: AD 215.
221. **Painting I. 4 hours.** Various media. Prerequisite: Completion of the foundation program.
222. **Painting II. 4 hours.** Object imagery, spatial relationships, and emotional, analytical, and psychological content in various media. Prerequisite: AD 221.
223. **Painting III. 4 hours.** Abstract painting: theories of spatial organization, optical phenomena, experimental employment of various media. Prerequisite: AD 222.
224. **Painting IV. 4 hours.** Theories and practices of color and color phenomena; pigment, light, and spatial illusion. Prerequisite: AD 223.
225. **Painting V. 4 hours.** Object imagery, spatial relationships, and emotional, analytical, and psychological content in various media. Prerequisite: AD 224.
232. **Sculpture I. 4 hours.** Principles of kinetic sculpture through various means and materials. Prerequisite: Completion of the foundation program.
233. **Sculpture II. 4 hours.** Object oriented; emphasis on forming processes and materials. Includes preparatory drawings and sketches. Prerequisite: AD 232.
234. **Sculpture III. 4 hours.** Comprehensive sculpture, stressing form and shape concepts. Methods of addition and extension in various media. Prerequisite: AD 233.
235. **Sculpture IV. 4 hours.** Abstract sculpture. Investigation of the principles of light, color volume, and scale, done as static constructions in various materials. Prerequisite: AD 234.
236. **Sculpture V. 4 hours.** Object oriented; emphasis on forming processes and materials. Includes preparatory drawings and sketches. Prerequisite: AD 235.

241. **Printmaking I.** 4 hours. Object and abstract studies relating the principles of drawing and design to the techniques of lithography and serigraphy. Prerequisite: Completion of the foundation program.
242. **Printmaking II.** 4 hours. Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: AD 241.
243. **Printmaking III.** 4 hours. Based on single and multiple-object imagery. Theory, technique, and practice in the various graphic media, emphasizing experimentation. Prerequisite: AD 242.
244. **Printmaking IV.** 4 hours. Advanced theories of spatial principles, form, and color, developed through the various printmaking media. Prerequisite: AD 243.
245. **Printmaking V.** 4 hours. Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: AD 244.
251. **Photography Colloquium I.** 1 hour. Films, lectures, and discussion relating to the appreciation and application of photography. Special lectures on related subjects. Prerequisites: A & A 115 and concurrent registration in AD 261.
252. **Photography Colloquium II.** 1 hour. Films, lectures, and discussion relating to the appreciation and application of photography. Special lectures on related subjects. Prerequisites: AD 251 and concurrent registration in AD 262.
253. **Photography Colloquium III.** 1 hour. Films, lectures, and discussion relating to the appreciation and application of photography. Special lectures on related subjects. Prerequisites: AD 252 and concurrent registration in AD 263.
254. **Film Colloquium I.** 1 hour. Writings on the theory of film. Film and the contemporary scene. Specific film showings and analysis. Special lectures by persons involved in the field. Prerequisite: Senior standing.
255. **Film Colloquium II.** 1 hour. Film and the contemporary scene. Specific film showings and analysis. Emphasis on documentation. Prerequisite: Senior standing.
256. **Film Colloquium III.** 1 hour. Film and the contemporary scene. Specific film showings and analysis. Prerequisite: Senior standing.
260. **Architectural Photography.** 3 hours. Special course in photography for students in architecture; environment, function, detail, models, scale, lighting, point of view. Prerequisite: A & A 114.
261. **Photography I.** 4 hours. Basic familiarity with the camera, enlarger, and studio. Introduction to high contrast emulsions and related materials. Experimental use of the media. Prerequisites: A & A 114 and concurrent registration in AD 251.
262. **Photography II.** 4 hours. Introduction to the communicative possibilities of the photographic statement as an isolate and as a series. Analysis of simple objects. Prerequisites: AD 261 and concurrent registration in AD 252.

263. **Photography III.** 4 hours. The photographic process applied to recording, documenting, and interpreting real life situations and events. Prerequisites: AD 262 and concurrent registration in AD 253.
264. **Photo-Film Synthesis.** 4 hours. Synthesis of photography-cinematography. Individual projects based on mixed media. Prerequisite: AD 263 or 273.
265. **Photography IV.** 4 hours. Applied photography in such diverse areas of the medium as experimentation, documentation, illustration, propaganda, design, and equivalence. Prerequisite: AD 264.
266. **Photography V.** 5 hours. A sustained project in any area of photographic activity. Prerequisite: AD 265.
270. **Color Photography.** 3 hours. Processes, techniques, and materials. Prerequisite: A & A 114.
271. **Cinematography I.** 4 hours. Communication of simple ideas with the motion picture camera. Basic use of various film handling methods; editing bench, splicer, projectors, and cameras. Prerequisite: A & A 115.
272. **Cinematography II.** 4 hours. Continues Art-Design 271. Introduction to the time-space properties of cinema from different points of view through the use of live action and stop motion camera. Prerequisite: AD 271.
273. **Cinematography III.** 4 hours. Continues Art-Design 272. Advanced techniques. Soundtrack reading and cutting. Analysis of objects and events with the motion picture camera. Prerequisite: AD 272.
274. **Animation.** 3 hours. Special introduction to basic techniques, including CEL animation. Use of type, color, shape, and texture on the animation stand. Prerequisite: Junior standing.
275. **Cinematography IV.** 4 hours. Credit is not given for this course until completion of a 300-level course. Comprehensive individual or group projects in various aspects of filmmaking. Prerequisite: AD 264.
276. **Cinematography V.** 5 hours. Continues Art-Design 275. Comprehensive individual or group projects in various aspects of film making. Prerequisite: AD 275.
281. **Foundations of Art Education.** 4 hours. Methods and techniques of art teaching, emphasizing creative and artistic development and the application of psychological and educational theories and practices to the teaching of art. Prerequisites: Ed. 170 and 210.
282. **Art Education Theory.** 4 hours. Problem-solving evaluation and survey of pertinent studies and theories in art education. Prerequisite: Credit or concurrent registration in AD 281.
355. **Photography-Film Tutorial I.** 5 hours. Independent study course. Sustained projects in any area of film activity or still photography. Prerequisite: AD 264.

356. **Photography-Film Tutorial II.** 5 hours. Independent study course. Sustained projects in any area of film activity or still photography. Prerequisite: AD 264.

BIOLOGICAL SCIENCES (BioS)

100. **General Biology.** 4 hours. Same as Information Engineering 100. With Biological Sciences 101 and 102, a three-quarter sequence that may be entered in any quarter. Audio-tutorial. Principles and fundamentals of biology through examination of diverse phenomena unique to biological systems. Lecture, laboratory, and discussion. F, Su
101. **General Biology.** 4 hours. Same as Information Engineering 101. Continues Biological Sciences 100. W
102. **General Biology.** 4 hours. Same as Information Engineering 102. Continues Biological Sciences 101. S
105. **The Zygote and Beyond.** 3 to 4 hours. Students may elect a concurrent hour of Biological Sciences 193 for a total of 4 hours. Examination of experiments and ideas important to the appreciation of present-day concepts in developmental biology. Lecture. Prerequisite: Non-major James Scholar Status. F
106. **Biology in Human Affairs.** 3 hours. Not offered for credit to students who have had Biological Sciences 124 or Natural Sciences 124. A look at man, his environment, and his relationship to other men, with the intent of providing a biological perspective for past, present, and future decisions. W
124. **Natural Sciences—Contemporary Biological Problems.** 4 hours. Not offered for credit to students who have had Biological Sciences 106. Same as Natural Sciences 124. Basic principles of evolution, genetics, biochemistry, and ecology; emphasis on biological problems of our society. Prerequisite: NatS. 123 or consent of the instructor.
133. **Human Biology I.** 5 hours. Same as Anthropology 133. Survey of the structure and functions of the human body; interrelationships of the various organ systems. Lecture and laboratory. Prerequisite: One year of biological sciences or consent of the instructor. F
134. **Human Biology II.** 5 hours. Same as Anthropology 134. The morphology and physiology of the human body; emphasis on the interrelationships of the various organs and systems. Three lectures and 6 hours of laboratory per week. Prerequisite: BioS. 133.
193. **Honors Biology.** 1 hour. Open only to freshmen, sophomores, and juniors. An additional hour of related work for students registered in a course in biological sciences. May be repeated for 1 hour each quarter. Prerequisites: James Scholar status or approval of the department for superior students, registration in a biological sciences course (except BioS. 299 or 300) and consent of the instructor. F, W, S

200. **History of Biology.** 3 hours. Major problems and suggested solutions from the earliest records to the present. Prerequisite: Four quarters of laboratory science. F
201. **Topics in Plant Phylogeny.** 4 hours. Major events in the evolution of plants and selected aspects of current problems in plant phylogeny. Lecture and laboratory. Prerequisites: BioS. 100, 101, and 102 or the equivalents.
202. **Elementary Plant Physiology.** 5 hours. Translocation, photosynthesis, respiration and basic metabolism, plant growth hormones, and plant growth. Prerequisite: One year of biological sciences. F
205. **Microtechnique.** 4 hours. Various methods of preparing animal and plant tissue for microscopic examination. Includes techniques and basic theories related to differential staining, histochemical and cytochemical reactions, and electron microscopy. Lecture and laboratory. Prerequisite: One year of biological sciences. W
210. **Selected Ideas in Regulatory Biology.** 4 hours. Topics will be chosen to illustrate the basic unifying principles in the biological sciences; emphasis on processes of biological thought. Lecture and laboratory. Prerequisites: One year of biological sciences and senior standing or consent of the instructor. F
211. **Selected Ideas in Evolutionary Biology.** 4 hours. Topics will be chosen to illustrate the basic unifying principles in the biological sciences; emphasis on processes of biological thought. Lecture and laboratory. Prerequisites: One year of biological sciences and senior standing or consent of the instructor. S
218. **Introduction to Paleontology.** 4 hours. Same as Geological Sciences 218. The phylogeny, morphology, and ecology of fossils; emphasis on the invertebrates. Two or three Saturday field trips are required. Prerequisite: One year of biological sciences or consent of the instructor. F
220. **Plant Taxonomy.** 4 hours. Classification and identification of flowering plants; emphasis on local flora. Lecture, laboratory, and occasional field trips. Prerequisite: One year of biological sciences. S
230. **Biology of Nonvascular Plants.** 4 hours. Structure and function in representative algae, fungi, slime-molds, and bryophytes in relation to their life cycles and phylogeny. Lecture and laboratory. Prerequisite: One year of biological sciences. F
232. **Plant Growth and Differentiation.** 4 hours. The developmental sequences in respect to time, light, temperature, and nutrition of selected vascular and non-vascular plants. Lecture and laboratory. Prerequisite: One year of biological sciences.
235. **Biology and Evolution of Human Behavior.** 4 hours. Same as Anthropology 235. Comparative behavior of human and nonhuman primates; biological bases of primate behavior in terms of general evolutionary trends. Critical review of the analytic methodology of the behavioral sciences. Prerequisites: One year of biological sciences and Anth. 130, or consent of the instructor. S

240. **General Genetics.** 5 hours. Same as Information Engineering 283. Principles of heredity and variation illustrating the gene concept. Examples include animal, plant, microorganism, and human heredity. Lecture, laboratory, and recitation. Prerequisite: One year of biological sciences. Math. 104, 105, 130 and organic chemistry are recommended. F, W, S, Su
250. **General Microbiology.** 5 hours. Introduction to the principal activities and properties of microorganisms, emphasizing fundamental concepts. Lecture and laboratory. Prerequisites: One year of biological sciences and credit or registration in organic chemistry. F, S
259. **Neurobiology.** 3 hours. Same as Information Engineering 259. Introduction to basic anatomical and physiological concepts of the human central nervous system. Prerequisite: One year of biological sciences or consent of the instructor. F
260. **Biology of Human Reproduction.** 3 hours. No credit for biological sciences majors. The anatomy and physiology of the human reproductive system. Lecture. Prerequisite: One year of biological sciences. W, S
261. **Cellular Biodynamics.** 5 hours. Same as Information Engineering 284. The basic physiological activities common to cells; the functions characteristic of specialized cell types. Lecture and laboratory. Prerequisites: One year of biological sciences and Chem. 134 or 234. F, W, S, Su
280. **Vertebrate Morphogenesis.** 5 hours. Same as Information Engineering 280. Introduction to vertebrate anatomy; emphasis on early embryology and histology. Lecture and laboratory. Prerequisite: One year of biological sciences.
281. **Structure and Development of Vertebrates I.** 5 hours. Same as Information Engineering 281. With Biological Sciences 282, a two-quarter sequence. Evolution of vertebrate organ systems; their embryogenesis and microscopic and gross anatomy. Lecture and laboratory. Prerequisite: BioS. 280. W
282. **Structure and Development of Vertebrates II.** 5 hours. Same as Information Engineering 282. Continues Biological Sciences 281. Prerequisite: BioS. 281. S
283. **Ornithology.** 4 hours. Introduction to the study of birds; their anatomy, physiology, behavior, and relationships with their environment. Special attention is given to migration. Prerequisite: One year of biological sciences. W
299. **Individual Topics.** 3 to 5 hours. For qualified students wishing to carry out individual problems. Laboratory, conferences, and assigned readings. Prerequisites: Senior standing and approval of the department. F, W, S, Su
300. **Seminar.** 0 to 1 hour. Faculty and visiting biologists discuss results of their research programs before staff and students at weekly meetings. Biological sciences majors must enroll for two quarters in their senior year; one hour of credit will be given at the completion of the second quarter. Attendance of majors at all meetings is strongly encouraged. Prerequisites: Biological sciences major, junior standing. F, W, S

303. **Quantitative Biology I.** 5 hours. Quantitative ideas and mathematical models in the development of biological theory and as a basis for biological experimentation. Lecture and laboratory. Prerequisites: Math. 131, and BioS. 240 or 315. F
304. **Cytology Laboratory.** 3 hours. Advanced cytology; emphasis on instrumental methods. Prerequisites: BioS. 261 and concurrent registration in BioS. 309, or consent of the instructor. F
307. **Biological Methods for Teachers.** 3 hours. Investigation of methodological subjects, conducted primarily as a practicum; emphasis on the development of competencies. Prerequisites: Senior standing and 40 hours of biological sciences. W
309. **Cytology.** 3 hours. Structure and function of cells as revealed through historical development and modern research techniques. Lecture. Prerequisite: Two years of biological sciences. F
313. **Developmental Biology.** 4 hours. Principles governing growth and differentiation at molecular, fine structural, cellular, and organismic levels. Lecture and laboratory. Prerequisite: One year of biological sciences. F
315. **Principles of Ecology.** 3 hours. Composition and distribution of biotic communities, plant and animal; emphasis on the interplay of physical and biological factors of the environment. Prerequisites: One year of biological sciences and concurrent registration in BioS. 324 or 380. F, S
316. **Invertebrate Paleontology.** 4 hours. Same as Geological Sciences 316. Phylogeny, morphology, and ecology of the fossil invertebrates. Prerequisites: BioS. 218 and consent of the instructor. F
318. **Vertebrate Paleontology.** 4 hours. Same as Geological Sciences 318. Phylogeny, morphology, and ecology of the fossil vertebrates. Prerequisites: One year of biological sciences and consent of the instructor. S
319. **Paleobotany.** 5 hours. Same as Geological Sciences 319. Structure, phylogeny, and stratigraphic distribution of representative fossil plants. Lecture, laboratory, and field trips. Prerequisite: One year of biological sciences. F
320. **Field Botany.** 5 hours. Flora and vegetation of the Chicago region. Lecture, laboratory, and field trips. Prerequisite: One year of biological sciences. S
321. **Plant Geography of North America.** 4 hours. Ecological and systematic treatment of vegetation regions and principal subdivisions; emphasis on environmental factors and floras. Prerequisite: BioS. 220 or 315. W
324. **Plant Ecology Laboratory.** 2 hours. Special attention to vegetation and environment of the Chicago region. Laboratory and field trips. Prerequisite: Concurrent registration in BioS. 315. F, S
326. **Plant Physiology I.** 3 hours. Photobiology of photosynthesis, photosynthetic carbon metabolism, formation of the photochemical apparatus, and respiration.

- Prerequisites: One quarter of biochemistry and concurrent registration in BioS. 328. F
327. **Plant Physiology II.** 3 hours. Water relations, translocation of solutes, growth, flowering, and phytohormones. Prerequisites: One quarter of biochemistry and concurrent registration in BioS. 329. W
328. **Plant Physiology Laboratory I.** 2 hours. Prerequisite: Concurrent registration in BioS. 326. F
329. **Plant Physiology Laboratory II.** 2 hours. Prerequisite: Concurrent registration in BioS. 327. W
331. **Human Evolution.** 4 hours. Same as Anthropology 331. Phylogeny of the primate order and the problems of speciation; particular emphasis on the relative roles of culture and nature as selective forces in human evolution. Prerequisite: Anth. 230 or 231, or BioS. 282 or 318. F, S
332. **Morphogenesis in Higher Plants.** 5 hours. Morphogenesis, growth, and differentiation of vascular plants and bryophytes. Emphasis on experimental approaches to plant development at the molecular, cellular, and organismic levels. Lecture and laboratory. Prerequisites: Chem. 234, and BioS. 313 or 333. W
333. **Morphology of Vascular Plants.** 4 hours. Structure, reproduction, and evolutionary history of representative vascular plants, including psilopsids, lycopsids, sphenopsids, ferns, gymnosperms, and angiosperms. Lecture and laboratory. Prerequisite: One year of biological sciences. W
342. **Cytogenetics.** 4 hours. Chromosomal phenomena involved in the mechanics of genetics, structure of genetic material, and the role chromosomal variation plays in the evolution of races and species. Lecture and laboratory. Prerequisite: BioS. 240. F
343. **Population Genetics.** 3 hours. Genetic dynamics for animal, plant, and human populations: mating systems, selection, sampling, and mutation. Lecture and recitation. Prerequisites: Consent of the instructor or BioS. 240, Math. 130, and credit or concurrent registration in statistics. W
344. **Experimental Population Genetics.** 3 hours. Discussion of experimental and field empirical studies estimating genetic parameters, influence of selection, and other evolutionary forces on genotypes in populations. Lecture, laboratory, and discussion. Prerequisite: BioS. 343. S
345. **Systematics and Evolution.** 3 hours. Consideration of principles and interrelationships; basic analysis of evolutionary mechanisms; rationale for classification systems; nature of taxonomic characters. Lecture and discussion. Prerequisites: One year of biological sciences and BioS. 240. W
347. **Physiological Genetics.** 3 hours. Consideration of heredity at the biochemical level; particular reference to mutation, the transcription and translation of genetic

information, and genetic regulatory mechanisms. Lecture. Prerequisites: BioS. 240 and Chem. 350.

349. **Evolutionary Theory.** 3 hours. Analysis of evolutionary mechanisms in plants and animals, variation and differentiation in populations and species; origins of super-specific taxa. Prerequisites: BioS. 315 and 345. W
350. **Advanced Microbiology.** 5 hours. Modern contributions to the cellular anatomy, physiology, and genetics of microorganisms. Lecture and laboratory. Prerequisites: BioS. 250 or 261 and credit or registration in biochemistry. Calculus is strongly recommended. F
351. **Principles of Cell and Tissue Culture.** 5 hours. Methods for primary isolation of plant and animal tissue and subsequent cultivation. Uses of cells in culture as experimental tools. Prerequisites: BioS. 250 and 261. F
353. **Chemical Biogenesis.** 3 hours. Same as Chemistry 353. Biosynthesis of important biological compounds. Lecture and discussion. Prerequisite: Chem. 134 or 234. W
356. **Mycology.** 4 hours. Analysis of the morphology, physiology, and genetics of fungi, as related to the taxonomy and phylogeny of fungi. Lecture and laboratory. Prerequisite: One year of biological sciences. F
359. **Neuroanatomy.** 4 hours. Introduction to the neurological organization of the mammalian central nervous system. Prerequisites: One year of biological sciences and consent of the instructor. W
361. **Macromolecules of Biological Importance.** 5 hours. Nucleic acids and proteins; emphasis on their roles in the replication of genetic material. Lecture and laboratory. Prerequisites: A course in organic chemistry and consent of the instructor. S
363. **Animal Physiology I.** 5 hours. Same as Information Engineering 383. The role of the digestive, circulatory, respiratory, and osmoexcretory systems in the maintenance of organismic homeostasis. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: BioS. 261. F, Su
364. **Animal Physiology II.** 5 hours. Same as Information Engineering 384. The role of the muscular, sensory, nervous, and endocrine systems in the maintenance of organismic integration. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: BioS. 261. W
377. **Endocrinology.** 5 hours. Animal hormones in the control of integration, homeostasis, growth, and development. Lecture and laboratory. Prerequisite: BioS. 364. W
380. **Animal Ecology Laboratory.** 2 hours. Population and community assemblages of the Chicago region. Laboratory and field trips. Prerequisite: Concurrent registration in BioS. 315.
382. **Environmental Conservation.** 3 hours. Applied ecology of the use of renewable natural resources; special emphasis on biotic problems of land, water, and air

management; pollution, population increase, multiple-use concept, and land ethics. Lecture and field trips. Prerequisites: BioS. 315 and either 324 or 380. F

- 384. **Invertebrate Zoology I.** 5 hours. Comparative study of structure, development, behavior, classification, and evolution of the lower invertebrate groups. Lecture and laboratory. Prerequisite: One year of biological sciences. W
- 385. **Invertebrate Zoology II.** 5 hours. Comparative study of structure, development, classification, and evolution of the higher invertebrate groups exclusive of arthropods. Lecture and laboratory. Prerequisites: BioS. 384 or consent of the instructor. S
- 388. **General Entomology.** 5 hours. Introduction to the morphology, physiology, classification, behavior, and evolution of insects. Lecture and laboratory. Prerequisite: 12 hours of biological sciences. F
- 389. **Principles of Protozoology.** 5 hours. Introduction to the comparative morphology, physiology, and systematics of the protozoa, including discussion of advances in major areas of current research. Lecture and laboratory. Prerequisite: One year of biological sciences. S
- 393. **Functional Animal Morphology.** 4 hours. Functional analysis of selected invertebrate and vertebrate organ systems applied to problems of comparative structure, adaptation, and phylogeny. Lecture and laboratory. Prerequisites: Senior standing and consent of the instructor. F
- 395. **Zoogeography.** 3 hours. Examination of the present and past distribution of animals; emphasis on physiographic and ecologic factors that affect the development of faunal regions. Experimental methods to elucidate mechanisms of origin and diversification of island and continental faunas. Prerequisite: Senior standing.
- 397. **Biology of Lower Vertebrates.** 4 hours. Experimental and descriptive studies on fishes, amphibians and reptiles; emphasis on ecology, speciation, and adaptive radiation. Lecture, laboratory, and field trips. Prerequisite: BioS. 218, 240, or 280.

BUSINESS LAW (BLaw)

- 310. **Managerial Jurisprudence.** 4 hours. Application of the legal function to business administration. Basic legal tools for business transaction and corporate operations; legal aspects of the major segments of business management. Prerequisite: Junior standing.

CHEMISTRY (Chem)

- 110. **Problem Solving in Chemistry.** 1, 2, or 3 hours. An individualized course in problem solving and mastery of the skills and concepts presumed in Chemistry 111. Prerequisite: Consent of the instructor.

111. **Introduction to Chemistry.** 4 hours. For students without entrance credit in high school chemistry or inadequately prepared for Chemistry 112. Prerequisite: Satisfactory performance on a placement examination. F, W, S, Su
112. **Chemical Bonding and Structure.** 5 hours. For students with one year of high school chemistry and adequate preparation, as shown by placement examination. Atomic and molecular structure; chemistry of the covalent and ionic bond. Prerequisite: Chem. 111 or adequate performance on the placement examination. F, W, S, Su
113. **Equilibria: Chemistry of Solutions.** 5 hours. Acid-base reactions, solubility relations, oxidation potentials; qualitative analysis. Prerequisite: Chem. 112 or superior performance on the placement examination or advanced placement or Chem. 117. College algebra or the equivalent is strongly recommended. F, W, S, Su
114. **Structure and Reactivity.** 5 hours. Elementary thermodynamics and kinetics; electrochemistry. Prerequisite: Chem. 113 or advanced placement. F, W, S, Su
115. **Equilibria: Chemistry of Solutions (for Engineers).** 3 hours. Acid-base reactions, solubility relations, oxidation potentials; qualitative analysis. Prerequisite: Chem. 112 or superior performance on the placement examination or advanced placement or Chem. 117. College algebra or the equivalent is strongly recommended. F, W, S
116. **Structure and Reactivity (for Engineers).** 2 hours. Elementary thermodynamics and kinetics; electrochemistry. Prerequisite: Chem. 113. W, S
117. **General and Analytical Chemistry I.** 6 hours. Primarily for students in the chemistry, chemical engineering, and physics curricula and natural science majors. Prerequisite: Superior performance on the placement examination. F
118. **General and Analytical Chemistry II.** 6 hours. Continues Chemistry 117. Prerequisite: Chem. 117 with a grade of C or higher. W
119. **General and Analytical Chemistry III.** 6 hours. Credit is not given for Chemistry 119 if the student has credit in 121. Continues Chemistry 118, with special emphasis on quantitative analysis. Prerequisite: Chem. 118. S
121. **Analytical Chemistry.** 5 hours. Credit is not given for Chemistry 121 if the student has credit in Chemistry 119. Volumetric, gravimetric and instrumental methods of analysis. Prerequisite: Chem. 114 or advanced placement. F, W, S, Su
123. **Natural Sciences—Chemical Evolution: Protons to Proteins.** 4 hours. Same as Natural Sciences 123. Basic principles of organic chemistry; emphasis on the molecular basis of life. Prerequisite: NatS. 122 or consent of the instructor.
132. **Elementary Organic Chemistry.** 5 hours. Primarily for prenursing students. This course does not satisfy the organic chemistry prerequisite for biochemistry or for advanced courses in organic chemistry. Prerequisite: Chem. 112. F, W, S, Su

133. **Basic Organic Chemistry I.** 4 hours. For students not majoring in chemistry. Structures, synthesis, and reactions of the more important classes of organic compounds. Prerequisite: Chem. 114.
134. **Basic Organic Chemistry II.** 4 hours. Continues Chemistry 133. Prerequisite: Chem. 133.
221. **The Study of Chemical Systems.** 3 hours. For students in the College of Engineering. Theoretical and experimental study of some aspects of the structure, properties, separation, and identification of chemical systems. Prerequisite: Chem. 116 or the equivalent.
233. **Organic Chemistry I.** 5 hours. For chemistry majors and students in the chemistry and chemical engineering curricula. The first quarter of a three quarter sequence in organic chemistry. Prerequisite: Chem. 114 or 119, F, W, S, Su
234. **Organic Chemistry II.** 5 hours. Continues Chemistry 233. Prerequisite: Chem. 233. F, W, S
235. **Organic Chemistry III.** 3 hours. Continues Chemistry 234. Lectures and assigned reading. Prerequisite: Chem. 234 or approval of the department. F, W, S, Su
237. **Organic Chemistry Laboratory.** 2 hours. Includes the opportunity for individual projects. Prerequisite: Credit or registration in Chem. 235. F, W, S, Su
281. **Elements of Glass Blowing.** 1 hour. Demonstrations and practice in glass blowing and the construction of simple laboratory equipment. Prerequisites: Junior standing in chemistry and consent of the instructor.
282. **Chemical Literature.** 1 hour. Survey of chemical information sources and retrieval procedures. Prerequisites: 24 hours of chemistry and four quarters (or the equivalent) of German or Russian or French. F, W, S
285. **History of Science, with Particular Reference to Chemistry.** 3 hours. The historical development of leading ideas in science and chemistry. Prerequisite: 26 hours of laboratory science. F, W, S
292. **Senior Research.** 2 to 9 hours. Total credit must be at least 4 hours and must not exceed 9 hours. It is recommended that the student divide his work over two quarters. Prerequisites: Senior standing and written permission from the department and from the instructor under whom the student is to work. F, W, S, Su
314. **Inorganic Chemistry.** 4 hours. Lectures and assigned readings on the chemistry of selected elements. Prerequisite: Chem. 340. W
315. **Inorganic Chemistry.** 4 hours. Lectures and assigned readings in structural inorganic chemistry, inorganic reaction mechanisms and techniques, and the nature of the coordinate bond. Prerequisite: Chem. 342 or the equivalent. S

316. **Inorganic Chemistry Laboratory.** 2 hours. Synthesis of inorganic compounds illustrating the use of modern preparative techniques. Prerequisite: Credit or registration in Chem. 315.
318. **Inorganic Chemistry.** 4 hours. Lectures and assigned readings on the chemistry of selected elements. Prerequisite: Consent of the instructor. S
321. **Chemical and Instrumental Analysis I.** 5 hours. Chemical and instrumental methods of analysis and their application to the quantitative study of chemical reactions. Prerequisites: Chem. 235 and credit or registration in Chem. 343 or the equivalents. F, W
322. **Chemical and Instrumental Analysis II.** 3 hours. Continues Chemistry. 321. Prerequisite: Chem. 321.
326. **Advanced Analytical Chemistry.** 4 hours. Analytical separation and experimental design of analytical methods. Prerequisite: Chem. 322.
338. **Systematic Identification of Organic Compounds.** 3 hours. Primarily a laboratory course; chemical, physical, and spectroscopic methods are used to separate, purify, and identify organic compounds. Prerequisite: Chem. 237. W
339. **Organic Synthesis.** 2 to 4 hours. Discussion and laboratory work involving special techniques in organic synthesis. Prerequisite: Chem. 237 or the equivalent.
340. **Physical Chemistry I.** 4 hours. Credit is not given for both the Chemistry 340-342-344 sequence and the 380-382 sequence. Introduction to the study of chemical principles. Prerequisites: Chem. 119 or 121, credit or registration in Math. 133, and one year of college physics. F
341. **Physical Chemistry Laboratory I.** 2 hours. Quantitative experimental study of chemical principles. Prerequisite: Concurrent registration in Chem. 340. F
342. **Physical Chemistry II.** 4 hours. Continues Chemistry 340. Prerequisite: Chem. 340. W
343. **Physical Chemistry Laboratory II.** 3 hours. Continues Chemistry 341. Prerequisites: Chem. 341 and concurrent registration in Chem. 342. W
344. **Physical Chemistry III.** 4 hours. Continues Chemistry 342. Prerequisite: Chem. 342. S
345. **Physical Chemistry Laboratory III.** 2 hours. Continues Chemistry 343. Prerequisites: Chem. 343 and concurrent registration in Chem. 344. S
347. **Introduction to Quantum Chemistry.** 4 hours. Application of quantum mechanics to problems of chemical interest. Additional assignments are required. Prerequisite: Chem. 344. F
348. **Thermodynamics.** 4 hours. Lectures and assigned readings; applications to chemical systems. Prerequisite: Chem. 344. W

349. **Statistical Thermodynamics.** 4 hours. Introduction to statistical mechanics and application to equilibrium thermodynamics. Individual projects are required. Prerequisite: Chem. 344. S
350. **General Biochemistry I.** 4 hours. Chemistry of biological systems, including enzymes, vitamins, nucleic acids, carbohydrates, and proteins. Prerequisites: Chem. 119 or 121, and 134 or 234. F
351. **General Biochemistry II.** 4 hours. Continues Chemistry 350. Prerequisite: Chem. 350. W
353. **Chemical Biogenesis.** 3 hours. Same as Biological Sciences 353. Biosynthesis of important biological compounds. Prerequisite: Chem. 134 or 234. S
355. **Biochemistry Laboratory I.** 2 hours. Introduction to experimentation with biochemical systems, processes, and compounds of biochemical importance. Prerequisite: Registration in Chem. 350. F
357. **Biochemistry Laboratory II.** 2 hours. Continues Chemistry 355. Prerequisites: Chem. 355 and registration in Chem. 351. W
361. **Advanced Organic Chemistry I.** 4 hours. A physical-organic approach to organic reactions with particular emphasis on reaction mechanisms and the relationship between reactivity and structure. Lectures and assigned readings. Prerequisites: Chem. 235 and 344. F
362. **Advanced Organic Chemistry II.** 4 hours. Continues Chemistry 361. Lectures and assigned readings. Prerequisite: Chem. 361. W
380. **Principles of Physical Chemistry I.** 4 hours. Credit is not given for both the Chemistry 380-382 sequence and the 340-342-344 sequence. Chemistry 380 and 382 provide an elementary introduction to physical chemistry; particular emphasis on topics of importance in the biological and health sciences. Prerequisites: Chem. 119 or 121, calculus, and two quarters of physics, or consent of the instructor. W
382. **Principles of Physical Chemistry II.** 4 hours. Continues Chemistry 380. Prerequisite: Chem. 380. S
383. **Elementary Physical Chemistry Laboratory.** 1 hour. An introductory laboratory course. Prerequisite: Chem. 380. S
384. **Surface and Macromolecular Chemistry.** 4 hours. Interfacial phenomena, stability of disperse systems, properties of polymer solutions. Prerequisites: Chem. 382 or the equivalent and consent of the instructor.
385. **Surface and Macromolecular Laboratory.** 2 hours. Techniques in surface and macromolecular chemistry. Prerequisites: Credit or registration in Chem. 384 and consent of the instructor.

391. **Problems in the Teaching of High School Chemistry.** 4 hours. New approaches to the discussion and presentation of topics in general chemistry. Prerequisite: Experience in teaching high school chemistry.
393. **Topics of Modern Chemistry.** 4 hours. Lectures, demonstrations, discussion, and literature in specialized areas of chemistry, including analytical, inorganic, organic, and physical chemistry and biochemistry. Prerequisite: Consent of the instructor.
399. **Independent Study.** Variable credit. 3 hours or more. May be repeated for credit. Supervised study in an area not represented by regularly offered courses. Prerequisites: Senior standing and written approval of the department. F, W, S, Su

CHINESE (Chin)

101. **Elementary Chinese I.** 4 hours. Four additional half hours per week in the language laboratory. Reading, grammar, and simple oral practice.
102. **Elementary Chinese II.** 4 hours. Four additional half hours per week in the language laboratory. Prerequisite: Chin. 101 or the equivalent.
103. **Elementary Chinese III.** 4 hours. Four additional half hours per week in the language laboratory. Prerequisite: Chin. 102 or the equivalent.

CLASSICS (Cl)

104. **The Tradition of Western Literature of the Ancient World.** 4 hours. Same as Humanities 104. Primarily for students not majoring in English or other languages. Selected masterpieces of poetry, drama, and fiction of the ancient world.
201. **Classical Etymology in the Life Sciences.** 2 hours. The structure and formation of technical terms used in the life sciences. W, S, F
248. **Mythology of Greece and Rome.** 4 hours. Same as Humanities 248. Myth and religion, history, folk tales, and literature. Open to sophomores with permission of the department. W, S, F
249. **Greek Tragic Drama in Translation.** 4 hours. Same as Humanities 249. Knowledge of Greek is not required. The plays of Aeschylus, Sophocles, Euripides. Prerequisite: Junior standing, or consent of the instructor. Su, F
251. **Greek Poetry in Translation.** 4 hours. Same as Humanities 251. Knowledge of Greek is not required. Classical Greek poetry from its beginnings to the Byzantine period. F
252. **Roman Satire.** 4 hours. Same as Humanities 252. Knowledge of Latin is not required. Selections from Horace, Persius, Petronius, Seneca, Martial, and Juvenal. W

253. **The Intellectual Development of Greece.** 4 hours. Same as Humanities 253. Knowledge of Greek is not required. Selections from the philosophers, poets, historians, and scientists. Prerequisite: Junior standing.
254. **Greek Comedy in Translation.** 4 hours. Knowledge of Greek is not required. The plays of Aristophanes and Menander. Prerequisite: Junior standing or consent of the instructor.
255. **Roman Comedy in Translation.** 4 hours. Knowledge of Latin is not required. The plays of Plautus and Terence. Prerequisite: Junior standing or consent of the instructor.
256. **Greek and Roman Epic Poetry.** 4 hours. Same as Humanities 256. Knowledge of Greek and Latin is not required. The epic poems of Homer, Lucretius, Vergil, and others in the Greco-Roman tradition. Prerequisite: Junior standing or consent of the instructor.
259. **Classical Literary Criticism.** 4 hours. Individual conferences on assigned papers are required. Same as Humanities 259. Examination of the primary extant sources of literary criticism: Aristotle, *Poetica*; Horace, *Ars Poetica*; Pseudo-Longinus, *On the Sublime*; Quintilian, *Institutio Oratoria*. Knowledge of Greek or Latin is helpful but not essential. Prerequisite: Junior standing.
280. **Monuments and Institutions of Athens.** 4 hours. Same as History 280. The monuments of Athens as they relate to the political and social institutions of the fifth century B.C. Prerequisite: Junior or senior standing.
290. **Urban Crises: Athens and Rome.** 4 hours. The response of two centers of antiquity to the problems and challenges of metropolitan communities. Ancient theories and texts on urban development. Prerequisite: Junior or senior standing.

DANCE (Dance)

100. **Creative Dance.** 1 hour. Exploration of movement; rhythmic analysis; dance composition.
200. **Dance in the Elementary School.** 3 hours. The development of rhythmic patterns in children, evaluation and lesson planning in elementary school dance, presentation of materials, uses of accompaniment and types of percussion instruments suitable for children. Prerequisites: Junior standing and Dance 100 and 235.
235. **Folk, Square, and Ballroom Dance.** 3 hours. Skills and techniques, rhythmic analysis, word cues, cultural history, and literature and music sources of folk, square, and ballroom dances.

ECONOMICS (Econ)

120. **Principles of Economics I.** 4 hours. The elements of economic analysis: concepts of economy, market organization, price determination and function. Prerequisite: Sophomore standing. F, W, S

121. **Principles of Economics II. 4 hours.** The elements of economic analysis, continued: determination of the level of economic activity; the effect of monetary and fiscal policies on economic activity levels. Applications to economic policy. Prerequisite: Econ. 120. F, W, S
320. **Macroeconomic Theory. 4 hours.** Principles of national income accounting, determination of aggregate income and employment, the monetary system in relation to income and employment, short-term income fluctuations, long-term income growth. Prerequisite: Fin. 340. F, W, S
321. **Microeconomic Theory. 4 hours.** Operation of individual markets; market structure; theory of the firm; theory of production; demand theory; general equilibrium and welfare economics. Prerequisite: Fin. 340. F, W, S
322. **Managerial Economics. 4 hours.** Application of economic theory to decision making in the business firm. Demand and cost analysis, including demand forecasts; price policy of the individual firm; capital budgeting; production analysis; uses of operations research methods. Prerequisite: Econ. 321. F, W, S
323. **Business Conditions Analysis. 4 hours.** Application of economic theory to analysis of changes in aggregate income and employment; quantitative economic models and their uses in the prediction of aggregate and more refined levels of business activity. Prerequisite: Econ. 320.
324. **Economic History of the United States. 4 hours.** Growth of the American economy from colonial times to the present; special emphasis on the forces and factors contributing to this process. Prerequisites: Econ. 121 and 8 hours of social sciences. F, S
325. **Economic History of Europe. 4 hours.** Evolution of the economic institutions of Europe, beginning with the origins of capitalism; the development of industry, commerce, transportation, finance, and labor. Prerequisites: Econ. 121 and 8 hours of social sciences. W
326. **History of Economic Thought. 4 hours.** Examination of the evolution of positive and normative economics from the sixteenth to the nineteenth century. Prerequisites: Econ. 121 and 9 hours of social sciences.
327. **Comparative Economic Systems. 4 hours.** Description and analysis of the normative and positive characteristics of capitalism, fascism, democratic socialism, and communism. Prerequisites: Econ. 121 and 8 hours of social sciences. F, W
328. **Government Finance. 4 hours.** Government finance at the federal, state, and local levels, including government expenditures; principles of taxation; fiscal policy; government borrowing and the national debt; and intergovernmental fiscal relations. Prerequisite: Econ. 321. F, W
329. **Industrial Organization. 4 hours.** The structure of markets; behavior of firms within the market environment; measures of industrial concentration; economics

of scale; mergers and the merger movement; price discrimination and tie-in sales; monopoly and cartel arrangements; resale price maintenance; innovation and technological change. Prerequisite: Econ. 321. W

330. **Government and Business.** 4 hours. The rationale and the mechanisms of the social control of business; the effects of government action in influencing the behavior of business firms; the procompetitive policy embodied in the Sherman Act and related legislation. Prerequisite: Econ. 321. F, S
331. **Labor Economics.** 4 hours. Economic problems and issues of trade union organization and wage theory; job security, hours, working conditions, labor legislation, unemployment. Prerequisite: Econ. 320 or 321. F, W, S
332. **Urban Economics.** 4 hours. Survey of economic problems of cities; the nature and function of cities; the demand for and supply of housing and urban land; the implications of location theory for the spatial pattern of cities; the impact of government programs. Prerequisites: Econ. 121 and 8 hours of social sciences. F, W, S
333. **International Economics.** 4 hours. The balance of payments; fixed, flexible, and multiple exchange rates; the forward exchange market; the international trade multiplier; the transfer problem; capital flows; the law of comparative advantage; the gains from trade; tariffs and subsidies; the factor price equalization theorem; international economic communities. Prerequisite: Econ. 320 or 321. F, W, S
334. **Economic Development.** 4 hours. Basic problems and characteristics of underdeveloped countries; classical, neoclassical, and modern contributions to the theory of development; major proposals for accelerating development; basic approaches to economic development; laissez-faire, interventionism; role and methods of planning; foreign aid; and economic integration. Prerequisite: Econ. 320 or 321. F, W, S
335. **Econometrics.** 4 hours. Specification of economic models; measurement of variables; estimation of economic relationships and testing of economic hypotheses; single equation problems in estimation; introduction to simultaneous equation estimation. Prerequisites: Econ. 320, 321, or consent of the instructor.
336. **Introduction to Mathematical Economics.** 4 hours. Application of mathematics to theories of consumer and producer behavior, to the determination of prices in markets, and to growth and stability features of macroeconomic models. Prerequisites: Econ. 320, 321, Math. 110 and 112.
338. **Independent Study in Economics.** 2 to 5 hours. May be repeated once for credit. For students who wish to do independent study in an area not covered by existing course offerings, or to explore in greater depth a problem or subject covered in a previously taken course. Prerequisites: 15 hours of 300-level courses in economics and consent of both a faculty member and the head of the department.
339. **Special Topics in Economics.** 4 hours. Exploration of an area not covered in existing course offerings or study in greater depth, or at a more advanced level, of

a problem or subject that is covered in an existing course. Subject matter, and sometimes the prerequisites, will vary from quarter to quarter; prior to registration students should consult the department secretary for further information. Prerequisites: Senior standing and 15 hours of 300-level economics courses.

EDUCATION (Ed)

Note: Classroom observation and/or related field experiences in the public schools are required of all students enrolled in each education course.

170. **Educational Foundations.** 4 hours. The philosophical, historical, and social forces influencing current issues and practices in American education; their relevance in understanding the role of the teacher. Prerequisites: Psych. 100 and 60 hours of work.
210. **The Educative Process.** 4 hours. An interdisciplinary study of the biosocial and psychological factors influencing learning processes; application of behavioral science knowledge to understanding the individual learner in the educative process. Prerequisite: Ed. 170 or the equivalent.
221. **Children's Literature.** 4 hours. A survey of children's literature from the seventeenth century to the present. Emphasis on the classics and present-day literature; methods of selection; using literature with children.
230. **Curriculum and Instruction in the Secondary School.** 4 hours. Basic principles of curriculum development, organization of learning experiences, the basic concepts of teaching. Application of the principles prepares the student for responsibilities in curriculum planning and classroom instruction in his fields of specialization. Prerequisite: Ed. 210.
235. **Curriculum and Instruction in the Elementary School.** 4 hours. Active investigation of the general dynamics of curriculum development at the elementary school level; special emphasis on research and synthesis in developing and coordinating the classroom experience. Prerequisites: Ed. 170 and 210.
241. **Bicultural Education: Spanish Speaking.** 4 hours. Sociology of how people who have experienced discrimination learn; psychology and sociology of racial prejudice; the industrial city and minority groups; subculture and contraculture and the relationship of these to the educative process.
242. **Bicultural Education: Comparative Study.** 4 hours. Cultural matrix of the bilingual child. Comparative study of Mexican-American, Puerto Rican, and United States cultural patterns of family, stratum and status, role of the teacher, and verbal and nonverbal communication.
245. **Creative Teaching in Elementary Schools.** 4 hours. Exploration of the principles and processes of creativity, emphasis on implications and applications for creative teaching. A creative approach to curriculum planning; content of curriculum areas, teaching, and learning are stressed. Prerequisites: Ed. 221 and 235, Art 204, Mus. 250, and PEW 220 and 221.

250. **Educational Evaluation.** 4 hours. Theories and methods of evaluation: the assessment of individuals, groups, and educational institutions in the attainment of educational objectives. Prerequisite: Ed. 230 or 235.
261. **Teaching Reading in the Elementary School.** 4 hours. The nature of the reading process; relationship of reading to child development, and its place in the total school program. Prerequisite: Ed. 230 or 235.
262. **Improving Reading in the Primary Grades.** 4 hours. In-depth study of readiness and beginning reading, relationship of reading to child development, and development of decoding skills. 10 hours of supervised field experience is included. Prerequisite: Ed. 261.
265. **Teaching of Reading in Secondary Schools.** 4 hours. The nature of the reading process; developmental needs of adolescents to help them to perceive the importance of reading instructions at junior and senior high school levels. Prerequisites: Ed. 170, 210, 230.
270. **Educational Practice with Seminar.** 8 hours. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.
271. **Educational Practice with Seminar II.** 8 hours. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit or concurrent registration in Ed. 270, admission to or continuation of advanced standing, and recommendation of the department of specialization.
272. **Educational Practice with Seminar—Urban Teacher Education I.** 5 hours. Restricted to students in innovative urban teacher education programs. The first quarter of a three-quarter professional laboratory sequence, including practice teaching with seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, recommendation of the department of specialization, and approval of the personnel committee of the teacher education project involved.
273. **Educational Practice with Seminar—Urban Teacher Education II.** 5 hours. Restricted to students in innovative urban teacher education programs. The second quarter of a three-quarter professional laboratory sequence, including practice teaching with seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 272 and approval of the personnel committee of the teacher education project involved.
280. **Survey of Characteristics and Education of Exceptional Children.** 4 hours. Seminar and observations that consider the physical, mental, emotional, and social characteristics of exceptional children (blind, deaf, mentally retarded, learning disabled, speech impaired, orthopedically handicapped, gifted). Prerequisites: Soc. 100, Ed. 210, and consent of the instructor.

281. **Psycho-Educational Aspects of Exceptional Children I.** 4 hours. Examination of the social and emotional adjustment of teachers and children in the special education classroom. Discussion and observation of personality, feelings of exceptionality, adjustment mechanisms, classroom therapy, and behavior of children and teachers. Laboratory practice is required. Prerequisites: Ed. 280 and consent of the instructor.
282. **Psycho-Educational Aspects of Exceptional Children II.** 4 hours. Investigation and examination of the personal professional skills necessary for providing special education for exceptional children; emphasis on the skills necessary for working with emotionally disturbed, learning disabled, and mentally retarded children. Laboratory practice is required. Prerequisites: Ed. 281 and consent of the instructor.
290. **Characteristics of Children with Special Learning Disabilities.** 5 hours. Clinic-workshop investigation of the significant psychological, educational, environmental, and medical correlates of special learning disabilities. Definitions, terminology, prevalence, characteristics, theories, and organizational structures. Prerequisite: Ed. 282.
291. **Methods of Teaching Children with Special Learning Disabilities.** 5 hours. Clinic-workshop investigation of diagnostic-remedial methods and their implementation in the special program for learning-disabled children. Analysis and synthesis of multidisciplinary research in the development and practice of a scientific pedagogy for special learning disabilities. Prerequisite: Ed. 290.
292. **Special Education Practicum—Learning Disability.** 12 hours. Full-time practice teaching in a special education program that involves children who have learning disabilities; a weekly seminar focuses on the problems that occur while working with these students. Prerequisite: Ed. 291.
293. **Special Education Practicum—Mental Retardation.** 12 hours. Full-time practice teaching in a special education program that involves children who are mentally retarded; a weekly seminar focuses on the problems that occur while working with these students. Prerequisite: Ed. 295.
294. **Characteristics of the Mentally Retarded Child.** 5 hours. Definitions, characteristics, classifications, etiology and syndromes, diagnosis and theoretical approaches, rehabilitation procedures, and educational implications. Laboratory practice is required. Prerequisites: Ed. 282 and consent of the instructor.
295. **Methods of Teaching the Educable Mentally Handicapped Child.** 5 hours. Curriculum development; diagnostic procedures; educational materials, methods, and techniques. Clinical practice in administering, interpreting, and evaluating diagnostic techniques is required. Prerequisites: Ed. 294 and consent of the instructor.
296. **Special Education Practicum—Emotionally Disturbed Child.** 12 hours. Full-time practice teaching in a special education program that involves children who are emotionally disturbed; a weekly seminar focuses on the problems that occur while working with these students. Prerequisite: Ed. 298.

297. **Psychology of the Maladjusted Child.** 5 hours. A clinical course combining field experiences, seminar activities, and lectures. Aspects of educational and psychological diagnosis of emotionally disturbed children served at the elementary school level; translating diagnostic materials into educational goals. Prerequisite: Ed. 282.
298. **Classroom Management and Remedial Interventions.** 5 hours. A clinical course utilizing field experiences, seminars, and lecture formats. Task and maintenance functions in the classroom, including methods, techniques, and materials, to be used in teaching emotionally disturbed children. Individual and group management problems in the classroom. Prerequisite: Ed. 297.
299. **Independent Study Program.** 1 to 4 hours. For undergraduate students who wish to do independent study on specific educational processes, or to do independent study on projects related to education, or to carry on extensive reading assignments. Prerequisite: A written proposal must be presented for faculty approval. F, W, S
301. **Educational Policy in Urban America.** 4 hours. Same as Political Science 301. Examination of selected urban phenomena in relation to educational bureaucracies and school socialization processes. Emphasis on historical investigation of strategies for protest and change employed by ghetto populations; conditions that fostered these strategies; responses of schools and other target institutions; social philosophical analysis of ideologies supporting both protest and response. Prerequisites: One course in the social foundations of education or the equivalent, and consent of the instructor.
320. **Social Development of Urban Children.** 4 hours. A basic course that covers the general principles of social learning and socialization during childhood, and the factors common to urban children that illustrate and modify these principles. Classroom observation of children and interviewing is required. Prerequisite: Psch. 220, or the equivalent by consent of the instructor.
321. **Learning in the Urban Classroom.** 4 hours. Examination of psychological theories and principles of learning as they apply to the teaching-learning process; particular attention to the investigation of central concepts of the psychology of learning in the urban classroom. Prerequisites: Ed. 210 and 250 or the equivalents and consent of the instructor.
323. **Introduction to Early Childhood Education.** 6 hours. 4 hours class time; 6 hours per week in schools. Educational implications of major schools of thought concerning the nature and course of child development and learning; differential effectiveness of programs oriented to various theories; special emphasis on intervention programs designed for impoverished populations, including Head Start. Prerequisites: Psch. 101 and 220 or the equivalents and consent of the instructor.
330. **Curriculum, Instruction, and Evaluation in Urban Education I.** 4 hours. A laboratory-discussion course; emphasizes the changing role of education in urban society and the implications of changes on curriculum decision making, design, instruction, and evaluation. Prerequisites: Ed. 250 or graduate standing and consent of the instructor.

370. **Field Work for Urban Education.** 8 hours. Time is shared between field work and the classroom to enable students to become intimately aware of some aspects of city life as it affects children and education. The different work sections are: a, workers in a black community; b, workers in a Latin or Indian community; c, workers in a selected white ethnic community; d, school administrators and counselors; e, workers in human relations arenas. Prerequisites: Ed. 250 or graduate standing and consent of the instructor.
371. **Community Education Laboratories.** 5 hours. 3 hours class time; 10 to 14 hours per week in directed field work. Analysis of the colonialist nature of the educational enterprise and of the relationships among the educational controllers, the teacher, and the community, through reading, lecture, discussion, and field work. Consideration of techniques for altering professional accountability of teachers from the employing community to those people the teacher purports to help: students and community. Prerequisite: Consent of the instructor.
390. **Critique of Educational Literature, Research Design, and Methodology.** 4 hours. Individual projects are assigned. Introduction to educational research literature; analysis of research findings in urban education; research methods and design in education; current issues in research methodology. Each student formulates a researchable problem and designs a systematic study in his area of concentration. Prerequisites: Ed. 250 or graduate standing and consent of the instructor.

ENERGY ENGINEERING (EnrE)

100. **Thermodynamics I.** 4 hours. Energy and the first law of thermodynamics. Properties and state. Entropy and the second law of thermodynamics. Prerequisite: MatE. 101.
200. **Thermodynamics II.** 4 hours. Engineering applications of the first and second laws. Equation of state. Multicomponent systems. Special topics. Prerequisite: EnrE. 100.
201. **Thermodynamics.** 4 hours. Macroscopic thermodynamics with some treatment of microscopic principles. First and second laws of thermodynamics and their applications to engineering systems of current interest. Equations of state. Prerequisite: Concurrent registration in Math. 132.
202. **Intermediate Thermodynamics.** 4 hours. Thermodynamics of state. Vapor and gas power cycles; refrigeration cycles. Prerequisite: EnrE. 201.
211. **Fluid Mechanics.** 4 hours. Fundamental laws governing fluid flow with applications to internal and external flow problems, including the effects of compressibility and viscosity. Prerequisites: EnrE. 201; credit or registration in Math. 220 or the equivalent.
212. **Potential Flow.** 4 hours. Basic irrotational flows, their combination and transformation used in modeling flows with solid surfaces. Elementary, two-dimensional airfoil theory. Prerequisite: EnrE. 211.

213. **Compressible Flow.** 4 hours. Compressible, isentropic, one-dimensional flow. Waves and characteristics in supersonic flows. Prerequisite: EnrE. 211.
214. **Viscous Fluid Mechanics.** 4 hours. Governing equations, energy dissipation, exact and approximate solutions, boundary layer theory, turbulent flows. Prerequisite: EnrE. 211.
215. **Engineering Hydrology.** 4 hours. Basic principles, methods of analysis, and applications for engineering planning and design. Major topics include the various phases of the hydrologic cycle, data collection and interpretation, water resources systems, determination of flow capacity for hydraulic structures. Statistical analysis. Prerequisite: EnrE. 211.
216. **Oceanography.** 4 hours. A study of the marine environment, both chemical and physical. Waves, currents, and mixing processes. Marine organisms. Prerequisite: EnrE. 214.
217. **Introduction to Meteorology.** 4 hours. The structure and thermodynamics of the atmosphere. Aspects of cloud formation, precipitation mechanisms, and heat transfer as related to meteorological phenomena. Wind structure and turbulence in the lower atmosphere. Study of the overall system. Prerequisites: EnrE. 211 and Math. 220.
221. **Heat Transfer.** 4 hours. Elementary treatment of the fundamental laws governing engineering heat transfer: conduction, convection, and radiation, with emphasis on physical understanding rather than empiricism; elementary application of the principles. Prerequisite: EnrE. 211.
232. **Chemical Process Analysis.** 2 hours. Material and energy balances applied to chemical systems. Thermochemical calculations of heats of reaction and combustion. Vapor pressure, solubility, and partial pressure. Calculations of chemical and metallurgical process systems. Prerequisites: EnrE. 201, Chem. 116.
234. **Transport Processes.** 4 hours. Transport processes of chemical engineering. Fluid systems, non-Newtonian fluids. Flow through porous media. Filtration. Centrifuging. Heat transfer with and without change of phase. Evaporation. Prerequisite: EnrE. 211.
235. **Chemical Engineering Laboratory I.** 1 hour. A 3-hour laboratory devoted to the study of mass, heat, and momentum transfer operations associated with chemical process equipment. Supplements EnrE. 234. Prerequisites: EnrE. 232, credit or registration in EnrE. 234.
241. **Experimental Methods in Solid and Fluid Mechanics.** 4 hours. Same as MatE. 241. Introduction to the theory and practice of experimental methods, measurement techniques in solids and fluids, analysis of errors. Concurrent laboratory experiments and reports. Prerequisites: EnrE. 211, MatE. 102 and 103.
281. **Design.** 4 hours. Independent study course. The design approach involving modeling, analysis, and synthesis of basic fundamentals in engineering problems. Prerequisite: Senior standing.

282. **Design.** 4 hours. Independent study course. The design approach to engineering projects requiring teamwork. Prerequisite: EnrE. 281.
285. **Diffusional Operations.** 4 hours. Applications of principles of stage-wise methods to heat and mass transfer operations. Studies of types of equipment as illustrated by fixed, continuous flow, and fluidized beds. Chemical engineering laboratory. Prerequisite: EnrE. 331.
286. **Chemical Reaction Engineering.** 4 hours. Principles of rate processes; application to chemical systems. Development of reactor unit concept. Interpretation of reactor data. Product distribution in multiple reactions; selection of rate controlling step. Application to design. Chemical engineering laboratory experience. Prerequisite: Chem. 342 or the equivalent.
292. **Undergraduate Research.** 2 to 4 hours. Research under close supervision of a faculty member. Prerequisites: Senior standing and consent of the instructor.
293. **Special Problems.** 2 to 4 hours. Special problems or reading by special arrangement with the faculty. Prerequisites: Senior standing and consent of the instructor.
304. **Transport Phenomena.** 4 hours. Introduction to continuum theory of momentum, energy, and mass transfer. Transport of scalar and vector quantities. Reynolds' transport theorem. General differential equations of transport phenomena. Momentum shell balances. Energy transport. Diffusion. Coupled operations, free convection, simultaneous heat and mass transfer, and like processes. Prerequisites: EnrE. 201 and 211, or consent of the instructor.
305. **Statistical Thermodynamics.** 4 hours. Statistical formulation; partition functions, including quantum effect. Application to macroscopic systems; systems of interacting particles. Emphasis on engineering applications. Prerequisites: EnrE. 201; Math. 220 or the equivalent.
307. **Kinetic Theory of Gases and Transport Phenomena.** 4 hours. Basic concepts of kinetic theory of gases. Equations of state and their molecular interpretation. Elementary classical statistics, molecular collisions. Application of the kinetic theory to viscosity, heat conduction, and diffusion. Prerequisite: Completion of the core program.
311. **Free Surface Flow.** 4 hours. Application of the fundamentals of fluid mechanics to fluids with a free surface. Channel flow and wind driven waves on the oceans' surface. Theory of gravity waves, capillary waves, and related phenomena. Prerequisites: EnrE. 212 and 214 or consent of the instructor.
312. **Porous Media.** 4 hours. Mechanics of fluid flow in porous media. Steady and unsteady laminar flow in isotropic and anisotropic media. Multiphase and multilayered systems. Prerequisites: EnrE. 212 and 215 or consent of the instructor.
313. **Aerodynamics of Flight.** 4 hours. Lift and drag, both subsonic and supersonic. Perturbation problems. Airfoil and slender body theories. Three-dimensional wings. Prerequisites: EnrE. 212 and 213 or consent of the instructor.

314. **Propulsion.** 4 hours. Thermodynamics and fluid mechanics of airbreathing engines. Performance of rockets: chemical, nuclear, and electrical. Prerequisites: EnrE. 213.
316. **Introduction to Continuum Mechanics.** 4 hours. Same as Materials Engineering 316. Cartesian tensors, kinematics of fluids and solids, conservative equations, constitutive equations for simple materials. Examples. Prerequisites: EnrE. 211 or MatE. 204 and Math. 220.
317. **Intermediate Fluid Mechanics.** 4 hours. Development of the conservation equations for a Newtonian fluid: continuity, Navier-Stokes, and energy equations. Some exact and approximate solutions of highly viscous, viscous, and inviscid flow problems. Prerequisite: Math. 220 or the equivalent.
321. **Intermediate Heat Transfer.** 4 hours. Topics in conduction, convection, and radiation heat transfer, with special emphasis on the exact solutions of the problems. Two-phase flow; heat exchangers; mass transfer cooling; rarefied gas analysis. Prerequisite: EnrE. 221, Math. 220 or consent of the instructor.
331. **Chemical Engineering Thermodynamics.** 4 hours. Review of first and second laws with subsequent applications to chemical systems. Free energy, availability, equilibrium conditions, and applications to chemical processes. Equilibrium constant, chemical potential for gas reactions, heterogeneous systems, and phase change. Prerequisite: EnrE. 201 or the equivalent.
341. **Experimental Methods and Techniques.** 4 hours. Purpose and design of experiments; statistical analysis of errors; wind tunnel, shock tube, high vacuum and chemical reactor techniques; theory of mechanical, thermal, optical, and chemical measurements. Prerequisite: Consent of the instructor.
351. **Electromechanical Energy Conversion I.** 4 hours. Conservation of energy, electromagnetic forces, applications to linear and nonlinear lumped-parameter systems, stability. Principles of rotating machines and equations of motion. Applications to synchronous, induction, d-c, and novel machines. Prerequisites: InfE. 221 and credit or registration in InfE. 311, or consent of the instructor.
352. **Electromechanical Energy Conversion II.** 4 hours. Continues Energy Engineering 351; completion of rotating machines. Interaction of electromagnetic fields with stationary and moving continuous media. Maxwell stress tensor and waves and instabilities. Applications to energy conversion with emphasis on fluids (magnetohydrodynamics). Prerequisites: EnrE. 211, 351, and InfE. 320.
353. **Direct Energy Conversion.** 4 hours. Novel methods of converting heat directly to electrical energy. Consideration of magnetohydrodynamics, thermoelectrics, thermionics, and fuel cells. Prerequisites: EnrE. 202 and 352 or consent of the instructor.
361. **Atmospheric Motions.** 4 hours. The equations of motion on a rotating earth and their application to dynamic meteorology. Various aspects of inertial, geostrophic, gradient, and thermal winds. Atmospheric turbulence and flow in the

earth's boundary layer. Diffusion of heat, water vapor, and atmospheric pollutants. Prerequisites: EnrE. 214 and 217 or consent of the instructor.

391. **Seminar.** 1 to 4 hours. May be repeated for additional credit. Topics to be arranged. Prerequisite: Consent of the instructor.

ENGLISH (Engl)

101. **Introduction to Poetry.** 4 hours. Same as Humanities 101. Reading and discussion of representative poems from the ancient world to the present.
102. **Introduction to Drama.** 4 hours. Reading and discussion of representative plays from the ancient world to the present.
103. **Introduction to Fiction.** 4 hours. Same as Humanities 103. Reading and discussion of representative fiction from the beginnings to the present.
111. **Introduction to Library Science for Teachers of High School English.** 4 hours. Examination of the principles of library organization, book selection, and research and bibliography for grades seven through twelve. Individual conferences on assigned papers are required. W, S, F
131. **Introduction to Shakespeare.** 4 hours. Introductory survey of Shakespeare's plays and poems. Prerequisite: Sophomore standing or exemption from Rhet. 102. F
150. **A Survey of English Literature I.** 4 hours. Note: English 150, 151, and 152 are required of all English majors. A chronological survey of the major works of English literature from about 760 to 1660. Prerequisite: Sophomore standing or exemption from Rhet. 102 or James Scholar status. W, S, Su, F
151. **A Survey of English Literature II.** 4 hours. A chronological survey of the major works of English literature from 1660 to 1832. Prerequisites: Sophomore standing or exemption from Rhet. 102 or James Scholar status and Engl. 150. W, S, Su, F
152. **A Survey of English Literature III.** 4 hours. A chronological survey of the major works of English literature from 1832 to the present. Prerequisites: Sophomore standing or exemption from Rhet. 102 or James Scholar status and Engl. 151. W, S, Su, F
190. **Sophomore Honors in English Literature I.** 4 hours. Chaucer through Milton. The first course in a three-quarter sequence designed to acquaint students with major works of English literature in chronological order. Prerequisite: Admission is by recommendation of the department only. F
191. **Sophomore Honors in English Literature II.** 4 hours. Dryden through Keats. The second course in the three-quarter sequence. Prerequisite: Admission is by recommendation of the department only. W

192. **Sophomore Honors in English Literature III.** 4 hours. Tennyson through T.S. Eliot. The third course in the three-quarter sequence. Prerequisite: Admission is by recommendation of the department. S
198. **Freshman Honors Seminar.** 4 hours. May be repeated for a maximum of 12 hours. Admission is by invitation after screening by University Honors Office, followed by further testing by the Department. Introduction to literature for selected freshmen. The subject of the seminar is changed every quarter. Students who complete three English 198 seminars may earn exemption from Rhetoric 102. Prerequisites: Freshman standing and admission to the honors program in English. F
- Note: 200-level and 300-level courses are restricted to juniors, seniors, and to those lower-division students who have the consent of the instructor.
210. **The Teaching of English.** 4 hours. For prospective teachers of English in secondary schools. Emphasis on theory and practice in the teaching of English. Prerequisite: Senior standing or consent of the instructor. W, S, Su, F
211. **Mythology of Greece and Rome.** 4 hours. Same as Classics 211. Myth and religion, history, folk tales, and literature. Prerequisite: Junior standing or consent of the instructor.
225. **English Literature of the Early Renaissance.** 4 hours. Sidney, Marlowe, Jonson, Spenser, and others. Prerequisite: Junior standing or consent of the instructor. S, F
226. **English Literature of the Late Renaissance and Interregnum.** 4 hours. Donne, Herrick, Bacon, Burton, Marvell, Hall, Herbert, Milton, and others. Prerequisite: Junior standing or consent of the instructor. W, Su
228. **English Prose of the Early Seventeenth Century from 1603 to 1660.** 4 hours. Representative selections, with emphasis on the works of Bacon, Browne, Donne, Milton. Prerequisite: Junior standing or consent of the instructor. W
231. **Shakespeare.** 4 hours. The young playwright's uses of older and current modes of drama, from Roman comedy and the history play through revenge tragedy. Prerequisite: Junior standing or consent of the instructor. S, F
232. **Shakespeare.** 4 hours. The mature playwright's handling of great tragic themes and his uses of tragicomedy. Prerequisite: Junior standing or consent of the instructor. W, Su
234. **Techniques of Literary Criticism and Scholarship.** 4 hours. Methods and approaches to the analysis and criticism of literary texts and techniques of scholarship. Prerequisites: Junior standing, English major, and either Engl. 152 or 190, 191, and 192.
243. **English Prose and Poetry of the Romantic Movement I.** 4 hours. Introductory study of the pre-Romantics, with emphasis on Blake and Burns, followed by a

close study of the early Romantics, with emphasis on Wordsworth and Coleridge. Prerequisite: Junior standing or consent of the instructor. S, F

244. **English Prose and Poetry of the Romantic Movement II.** 4 hours. Poetry and fiction of Scott; poetry, criticism, and letters of Byron, Shelley, and Keats; prose of Landor, Hazlitt, Hunt, and De Quincey. Prerequisite: Junior standing or consent of the instructor.
246. **English Literature from 1660 to 1700.** 4 hours. Reading in the representative works of the major authors, and review of the developing genres, of the late seventeenth century—exclusive of the novel. Prerequisite: Junior standing or consent of the instructor.
247. **English Literature from 1700 to 1730.** 4 hours. Readings in the representative works of the major authors, and review of the developing genres, of the early eighteenth century, exclusive of the novel. Prerequisite: Junior standing or consent of the instructor.
248. **English Literature from 1730 to 1798.** 4 hours. Major authors of the middle and late eighteenth century and the intellectual and historical background; emphasis on the novelists, the Johnson circle, and the pre-Romantics. Prerequisite: Junior standing or consent of the instructor. W, Su
249. **Greek Tragic Drama in Translation.** 4 hours. Same as Classics 249. Knowledge of Greek is not required. The plays of Aeschylus, Sophocles, Euripides. Prerequisite: Junior standing or consent of the instructor. F
250. **The Eighteenth Century Novel.** 4 hours. Brief survey of antecedents; discussion of the major novelists (Defoe, Richardson, Fielding, Smollett, and Sterne) and of the development of new forms and kinds, including the novel of sensibility, the novel of manners, the Gothic novel or tale of terror, and other subtypes. Prerequisite: Junior standing or consent of the instructor. W
255. **Survey of American Literature I.** 4 hours. From 1607 to the Civil War. American literature and its cultural background from the beginnings through Poe. Prerequisite: Junior standing or consent of the instructor. W, S, Su, F
256. **Survey of American Literature II.** 4 hours. American literature and its cultural background from the Transcendentalists to 1912. Prerequisites: Junior standing or consent of the instructor and Engl. 255. W, S, Su, F
257. **Survey of American Literature III.** 4 hours. Major figures in American literature from 1912 to the present. Prerequisites: Junior standing or consent of the instructor and Engl. 256. W, S, Su, F
259. **The Victorian Novel.** 4 hours. A critical study of selected novels of the Victorian era, including works by Dickens, Thackeray, Trollope, George Eliot, Meredith, Hardy, and others. Prerequisite: Junior standing or consent of the instructor.

263. **Victorian Poetry.** 4 hours. Significant English poets of the Victorian period, from Tennyson to Hardy. Prerequisite: Junior standing or consent of the instructor.
264. **Victorian Prose.** 4 hours. Nonfictional prose of the Victorian period, including Carlyle, Mill, Newman, Arnold, Ruskin, Pater, and others. Prerequisite: Junior standing or consent of the instructor.
273. **The Bible as Literature I: The Old Testament.** 4 hours. Same as Humanities 273. An historical and analytical study of the Old Testament portion of the English Bible, concentrating on the King James Version, with attention given to more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.
274. **The Bible as Literature II: The Apocrypha and the New Testament.** 4 hours. Same as Humanities 274. An historical and analytical study of the Apocrypha and New Testament portions of the English Bible, concentrating on the King James Version, with attention given to more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.
281. **Modern Drama I.** 4 hours. Major playwrights and the trends in drama from 1870 to about 1920; particular attention to Ibsen, Strindberg, Shaw, Chekhov. Prerequisite: Junior standing or consent of the instructor. W, F
282. **Modern Drama II.** 4 hours. Major trends and dramatists from the 1920's to the present, including Pirandello, Brecht, O'Neill, Lorca, O'Casey, Giraudoux, Beckett, and others. Prerequisite: Junior standing or consent of the instructor.
283. **English Literature in the Twentieth Century I.** 4 hours. From the 1890's to about 1930. Prerequisite: Junior standing or consent of the instructor. S, F
284. **English Literature in the Twentieth Century II.** 4 hours. From about 1930 to the present. Prerequisite: Junior standing or consent of the instructor. W, S
285. **Modern Irish Literature—Fiction.** 4 hours. Major writers from the period of the Irish Literary Revival to the present (1880-1960): James Joyce, George Moore, James Stephens, Frank O'Connor, Samuel Beckett, and others. Prerequisite: Junior standing or consent of the instructor.
286. **Modern Irish Literature—Drama and Poetry.** 4 hours. Major playwrights and poets from the Irish Literary Revival to the present (1880-1960): W.B. Yeats, George Russell (AE), J.M. Synge, Lady Gregory, James Stephens, Sean O'Casey, Samuel Beckett, Austin Clarke, and others. Prerequisite: Junior standing or consent of the instructor.
287. **Forms of Modern Fiction.** 4 hours. Same as Humanities 287. Major trends in the development of modern fiction from Flaubert to Faulkner. Prerequisite: Junior standing or consent of the instructor.
288. **The Twentieth Century American Novel to 1945.** 4 hours. Historical and critical study of the development of the American novel from Dreiser to the end of World

- War II. Close reading of several representative novels. Prerequisite: Junior standing or consent of the instructor. W, S, Su, F
289. **Development of Modern Poetry.** 4 hours. Hardy, Yeats, Auden, Dylan Thomas, Frost, Stevens, Eliot, Cummings, and others. Prerequisites: Junior standing and 8 hours of English literature or consent of the instructor. S, F
 290. **Modern British Fiction.** 4 hours. Representative works of fiction, both short fiction and novels, by important modern English writers from Conrad to the present. Prerequisite: Junior standing or consent of the instructor. W, F
 291. **The American Novel Since World War II.** 4 hours. Historical and critical study of the development of the American novel from 1945 to the present. Close reading of several representative texts. Prerequisite: Junior standing or consent of the instructor.
 292. **Contemporary Poetry.** 4 hours. The significant tendencies and key figures in American and British poetry since World War II. Recent writers are examined against the larger background of modernist literature. Prerequisite: Junior standing or consent of the instructor.
 295. **Modern English Grammars.** 4 hours. Same as Linguistics 295. Introduction to the newer grammars of English, including the structural and transformational; some attention to their applications in the teaching of English. Prerequisite: Junior standing or consent of the instructor.
 297. **Student-Initiated Course: Topics in Literature.** 4 hours. Intensive study of a specific theme, genre, subject, or author; emphasis on English and American literature. All course proposals must be approved by the English Department before the course can be offered. Instructions for the preparation and submission of course proposals may be obtained from the department. Prerequisite: Junior standing or consent of the instructor.
 298. **Senior Honors Seminar.** 4 hours. May be repeated for a maximum of 12 hours. Close study of the works of a particular author or group of authors, of a literary movement or idea, or similar material. The subject of the seminar is changed each quarter. Prerequisites: Senior standing and admission to the honors program in English. W, S, F
 299. **Independent Study.** 1 to 4 hours. Open only to English majors. Individual studies under the direction of an assigned faculty member. Nature of the work is determined by the tutor on the basis of the student's particular needs and interests. Prerequisite: Senior standing. Admission to this course is only on the advice of and is initiated by the English Department.
 301. **History of the English Language.** 4 hours. English in its relationship to other languages; historical account of its development. Prerequisite: 12 hours in English, Senior standing or consent of the instructor.
 302. **Tennyson and Browning.** 4 hours. Close study of the lyric poetry and the dramatic monologues of Tennyson and Browning; briefer examination of Tennyson's

Arthurian idylls and of the plays of both. Prerequisite: Junior standing or consent of the instructor. S

303. **Carlyle and Mill. 4 hours.** Major works. Prerequisite: Junior standing or consent of the instructor. S
304. **George Eliot and Trollope. 4 hours.** Close study of novels by George Eliot and Anthony Trollope; their relationship to both the Victorian era and the development of the novel. Prerequisite: A minimum of 12 hours in English.
305. **Newman and Arnold. 4 hours.** The prose of one early and one mid-Victorian writer: their contributions to nineteenth century religious and educational theories. Arnold's literary and social criticism. The rhetoric of both; brief reference to the poems and letters of each that most closely parallel ideas and moods in their prose. Prerequisite: Junior standing or consent of the instructor. W, F
306. **Dickens and Thackeray. 4 hours.** Close study of the major writings of the two representative Victorian novelists. Prerequisite: Junior standing or consent of the instructor. W, Su
307. **Yeats and Eliot. 4 hours.** Detailed study of the two most influential twentieth century poets writing in English. Study of specific texts; some emphasis on the intellectual and spiritual attitudes represented by each. Prerequisite: Junior standing or consent of the instructor. F
308. **Conrad and Lawrence. 4 hours.** The short fiction and novels of two important modern British writers; examinations of their contrasting views of the purpose of fiction. Prerequisite: A minimum of 12 hours in English.
310. **American Puritanism. 4 hours.** Intensive study of the writings of the American Puritans from William Bradford to Jonathan Edwards. Major aspects of Puritan life and thought. Prerequisite: A minimum of 12 hours in English. S
311. **Chaucer. 4 hours.** Readings in the major works. Prerequisite: Junior standing or consent of the instructor. W, S, F
312. **Introduction to Old English. 4 hours.** Elements of Old English grammar and the reading of graded prose selections. Prerequisite: Senior standing, 12 hours in English, or consent of the instructor. S, F
313. **Old English Poetry and Prose. 4 hours.** Heroic, elegiac, and religious poetry of England to 1200, exclusive of *Beowulf*; representative prose. Prerequisite: Engl. 312. W
314. ***Beowulf*. 4 hours.** Detailed explication of the poem. Prerequisite: Engl. 313. S
316. **American Drama. 4 hours.** Major dramatic writings in American literature. Prerequisite: Junior standing or consent of the instructor. W, S, Su, F

317. **The Writing of Poetry. 4 hours.** Limited to 15 students. May be repeated for a total of 12 hours. The practice of the writing of poetry, aided by intensive study of examples. Prerequisite: 12 hours of English literature or consent of the instructor. W, S, Su, F
318. **The Aesthetic Movement from 1850 to 1900. 4 hours.** Major figures and ideas behind the Pre-Raphaelite Brotherhood and the Aesthetic Movement in the last half of the nineteenth century in England. Prerequisite: Junior standing or consent of the instructor.
319. **Introduction to Middle English. 4 hours.** A linguistic examination of Middle English and its dialects. Prerequisite: Junior standing or consent of the instructor.
321. **Medieval Literature I. 4 hours.** Selected works in Middle English and Continental medieval writings in English translation. Prerequisite: A minimum of 12 hours in English. S
322. **Medieval Literature II. 4 hours.** Continues English 321. Prerequisite: A minimum of 12 hours in English.
323. **Wordsworth and Coleridge. 4 hours.** A close examination of the major works, both poetry and prose. Prerequisites: Engl. 243 and 244 or consent of the instructor. W
324. **Byron, Shelley and Keats. 4 hours.** The major figures of the second generation of Romantics. Prerequisite: Junior standing or consent of the instructor. F
325. **The Writing of Fiction. 4 hours.** Limited to 15 students. May be repeated for a maximum of 12 hours. The practice of the writing of fiction, aided by intensive study of examples. Prerequisites: Junior standing and 8 hours of English literature or consent of the instructor.
331. **The Important Minor Plays and the Poems of Shakespeare. 4 hours.** Plays, poems, and sonnets. Prerequisite: Engl. 231 or 232 or consent of the instructor. W, F
332. **The Poetry of Edmund Spenser. 4 hours.** Introduction to *The Faerie Queen* and *The Shepheardes Calender*: some attention to the minor verse and its place in the English Renaissance. Prerequisite: A minimum of 12 hours in English.
334. **Literary Criticism, Theory and Practice. 4 hours.** Survey of literary criticism, focusing on major critics from Plato to Arnold. Prerequisite: Junior standing or consent of the instructor. W, S, Su, F
335. **Modern Literary Criticism. 4 hours.** Survey of modern literary criticism from Matthew Arnold to the present. Prerequisites: Junior standing or consent of the instructor and Engl. 334. W, S, Su, F
337. **Exercises in Literary Criticism: Poetry. 4 hours.** Advanced course in practical criticism of poetry in English. Prerequisites: Junior standing and Engl. 335 or the equivalent, or consent of the instructor. W, S, F

338. Tragedy. 4 hours. A formal and theoretic inquiry into tragedy: its origins, evolution, and significance, based on selected masterworks of various periods. Prerequisite: Junior standing or consent of the instructor. F
339. Comedy. 4 hours. History and theory of comic drama. Prerequisite: Junior standing or consent of the instructor.
340. English and American Satire. 4 hours. Selected writings. Prerequisite: A minimum of 12 hours in English.
341. Dryden. 4 hours. Individual conferences on assigned papers are required. Poems, plays, and literary criticism; emphasis on the interaction of these genres in Dryden's development. Prerequisite: Junior standing or consent of the instructor. W, F
342. The Poetry of Milton. 4 hours. Origins, forms, and artistic and ethical values; Milton's place in English literary history. Prerequisite: A minimum of 12 hours in English. S
343. Tudor Drama. 4 hours. The rise of English drama from shortly after the medieval period to the building of permanent theaters in London and the death of Elizabeth; emphasis on the works of Christopher Marlowe. Prerequisite: A minimum of 12 hours in English.
344. Stuart Drama. 4 hours. English drama from the accession of James I to the closing of the theater in 1642 by the Puritan "long" Parliament; emphasis on the works of Ben Jonson. Prerequisite: A minimum of 12 hours in English.
345. The Metaphysical Poets. 4 hours. The poetry of Donne, Herbert, Vaughan, Crashaw. Special emphasis on Donne. Prerequisite: Junior standing or consent of the instructor. W
347. Restoration Drama. 4 hours. Major dramatic works after the reopening of the public theaters in 1660; development from aristocratic Baroque tragedy and comedy to the beginnings of bourgeois sentimental drama. Dryden, Etherege, Wycherley, Congreve, Vanbrugh, Farquhar, Otway, Cibber, and others. Prerequisite: Junior standing or consent of the instructor. S, F
348. Swift. 4 hours. A detailed study of the works of Jonathan Swift in the light of the intellectual and aesthetic currents of the period. Prerequisite: A minimum of 12 hours in English. S
349. Johnson and Boswell. 4 hours. The principal writings. Prerequisite: Junior standing or consent of the instructor.
350. The American Transcendentalists. 4 hours. The Transcendentalist circle in and about Concord from 1830 to 1860: Emerson and Thoreau, Alcott, Brownson, Fuller, Ripley, Parker, Channing, and others. Prerequisite: Engl. 255 or Hist. 356 or 357. F

351. **English Prose of the Eighteenth Century.** 4 hours. A survey; emphasis on the development of prose styles and their relation to modes of thought in the century. Prerequisite: A minimum of 12 hours in English.
352. **Pope.** 4 hours. Detailed study of the work of Alexander Pope in the light of the intellectual and aesthetic currents of the period. Prerequisite: Junior standing or consent of the instructor.
353. **Eighteenth Century Drama.** 4 hours. Major dramatic works and trends. Steele, Addison, Rowe, Gay, Lillo, Garrick, Cumberland, Goldsmith, Sheridan, and others. Prerequisite: Junior standing or consent of the instructor.
355. **American Fiction from 1800 to 1860.** 4 hours. Intensive study of the background and development of traditions and themes. Prerequisite: Junior standing or consent of the instructor. S
357. **Studies in the Short Story.** 4 hours. The short story as a literary form; close readings of selected short stories. Prerequisite: Junior standing or consent of the instructor. S, Su, F
364. **Readings in the Lyric I: European.** 4 hours. Selections from Sappho, Catullus, Petrarch, Villon, San Juan de la Cruz, Goethe, Leopardi, Baudelaire. Students are expected to have a reading knowledge of at least one of the foreign languages involved. Prerequisite: Junior standing or consent of the instructor. F
365. **Readings in the Lyric II: English.** 4 hours. Selected lyrics from the thirteenth through the nineteenth centuries. Prerequisite: A minimum of 12 hours in English.
366. **Readings in the Lyric III: Twentieth Century.** 4 hours. Selections from Yeats, Valery, Rilke, Frost, Montale, Garcia Lorca, Auden. Students are expected to have a reading knowledge of at least one of the foreign languages involved. Prerequisite: Junior standing or consent of the instructor.
375. **Henry James and the Technique of Fiction.** 4 hours. Development of Henry James as a novelist. Prerequisite: A minimum of 12 hours in English. S
376. **W.D. Howells: Realism in Fiction and Criticism.** 4 hours. The career of William Dean Howells as journalist, novelist, editor, and critic; his influences on the development of realism in late nineteenth and early twentieth century American literature. Prerequisite: Junior standing or consent of the instructor. W
377. **Naturalism in the American Novel: Dreiser, Crane, Norris, Lewis, and Others.** 4 hours. The development of the naturalistic novel; special emphasis on Dreiser and his followers. Prerequisite: Junior standing or consent of the instructor.
380. **The Rise of Realism.** 4 hours. Realism in American fiction from 1850 to 1900: Old Southwest humor, local color, Twain, Howells, Crane, the early naturalists, and others. Prerequisite: Engl. 256. W

382. **The Plays of Bernard Shaw.** 4 hours. A critical, social, and philosophical inquiry. Prerequisite: Junior standing or consent of the instructor. F
385. **Faulkner and Hemingway.** 4 hours. Studies in the short stories and novels of the two writers; examination of their literary theories. Prerequisite: Junior standing or consent of the instructor. W
386. **Hawthorne and Melville.** 4 hours. Two major writers of the nineteenth century; detailed analysis of one major novel of each. Prerequisite: Engl. 255 or consent of the instructor. S
388. **Southern Fiction.** 4 hours. Major works. Prerequisite: Junior standing or consent of the instructor. S
389. **Walt Whitman and Emily Dickinson.** 4 hours. The poetry and major prose of Whitman; the poems of Emily Dickinson. Prerequisite: Consent of the instructor or an A or B in any one of the following: Engl. 256, 289, 302, 307, 323, 324, 345, or 366. W
392. **The Negro in American Literature: Poetry.** 4 hours. Historical and analytical study of the Negro contribution to American poetry. Prerequisite: Junior standing or consent of the instructor. F
393. **The Negro in American Literature: Prose Fiction.** 4 hours. Historical and analytical study of the Negro contribution to American prose fiction. Prerequisite: Junior standing or consent of the instructor. W
394. **Studies in American-Negro Literature.** 4 hours. Detailed study of aspects of writing by American Negroes. Prerequisite: Junior standing or consent of the instructor. S
399. **Independent Study.** 1 to 4 hours. Open only to English majors and graduate students in English. Admission to this course is only on advice of and is initiated by the English Department. Individual studies under the direction of an assigned faculty member. Nature of the work is determined by the tutor on the basis of the student's needs and interests. Prerequisite: Senior standing.

FINANCE (Fin)

340. **Money and Banking.** 4 hours. Monetary and banking systems; the Federal Reserve System; monetary theory; price fluctuations; foreign-exchange financing; specialized financial institutions in the United States. Prerequisite: Econ. 121.
341. **Business Finance.** 4 hours. Nature of business finance and its relation to economics, accounting, and law; legal nature and forms of business enterprise; capital, capitalization, and financial planning; financial analysis and interpretation, initial financing, refinancing, working capital; income administration, including dividend policies; expansions; internal and external financial and economics relationships of the firm. Prerequisites: Actg. 102 and Econ. 320.

342. **Investments. 4 hours.** Types and distinguishing features of securities, security markets, analysis of financial statements and principles of valuation, quality differences, selection of securities to meet varying personal and institutional objectives. Prerequisites: Fin. 340 and 341.
343. **Risk and Insurance. 4 hours.** Basic principles; applications in different areas (life and property insurance); management of risks in the firm insurance versus self-insurance); social and economic significance of insurance in the economy. Prerequisites: Fin. 340 and 341.
344. **Investment Policy. 4 hours.** Varying strategies to meet diverse objectives; investments for individuals, business firms, banks, insurance companies, pension and profit-sharing funds; interrelation of investment policies and the economic environment. Prerequisites: Fin. 342 and Econ. 323.
345. **Problems in Business Finance. 4 hours.** Selected areas in advanced corporate finance, including short term asset management; capital budgeting under certainty and uncertainty; capital structure and dividend policy and theory; valuation and risk; the structure of capital asset prices, and implications of that structure for financial policy of firms. Prerequisite: Fin. 341.

FRENCH (Fr)

101. **Elementary French. 4 hours.** Two additional half hours per week in the language laboratory. For students who have not studied French. Grammar, pronunciation, reading, composition, conversation. F, W, S
102. **Elementary French. 4 hours.** Two additional half hours per week in the language laboratory. Continues French 101. Prerequisite: Fr. 101 or the equivalent. F, W, S
103. **Elementary French. 4 hours.** Two additional half hours per week in the language laboratory. Continues French 102. Prerequisite: Fr. 102 or the equivalent. F, W, S, Su
104. **Intermediate French. 4 hours.** Two additional half hours per week in the language laboratory. Rapid reading of modern authors, syntax and composition, conversational practice. Prerequisite: Fr. 103 or two years of high school French or the equivalent. F, W, S
105. **Intermediate French. 4 hours.** Two additional half hours per week in the language laboratory. Continues French 104. Prerequisite: Fr. 104 or the equivalent. F, W, S
106. **Intermediate French. 4 hours.** Two additional half hours per week in the language laboratory. Continues French 105. Prerequisite: Fr. 105 or the equivalent. F, W, S, Su
107. **Reading French I. 4 hours.** Primarily for upper division and graduate students in other departments. Does not meet graduation requirements in a foreign language. Basic grammar, vocabulary, and reading practice for beginning students who wish to acquire a rapid reading knowledge of French. F

108. **Reading French II. 4 hours.** Grammar, vocabulary; general and special reading and translation. Prerequisite: Fr. 107 or 103 or the equivalent. W
109. **Reading French III. 4 hours.** Continues French 108. Prerequisite: Fr. 108 or 105, or the equivalent. S
110. **Intermediate French—Reading Option I. 4 hours.** May be substituted for French 104. Satisfies the graduation requirement in the College of Liberal Arts and Sciences if taken with French 111 and 112. Readings in French; emphasis on cultural materials. Class discussion in English. Note: French 110, 111, and 112 do not satisfy the prerequisite requirements for French 201, 202, and 203. Prerequisite: Fr. 103 or two years of high school French or the equivalent. F, W, S
111. **Intermediate French—Reading Option II. 4 hours.** May be substituted for French 105. Satisfies the graduation requirement in the College of Liberal Arts and Sciences if taken with French 112. Readings in French; emphasis on cultural materials. Class discussion in English. Note: French 110, 111, and 112 do not satisfy the prerequisite requirements for French 201, 202, 203. Prerequisite: Fr. 110 or the equivalent. F, W, S
112. **Intermediate French—Reading Option III. 4 hours.** May be substituted for French 106. Satisfies the graduation requirement in the College of Liberal Arts and Sciences. Readings in French; emphasis on cultural materials. Class discussion in English. Note: French 110, 111, and 112 do not satisfy the prerequisite requirements for French 201, 202, and 203. Prerequisite: Fr. 111 or the equivalent. F, W, S
113. **Conversational Practice. 2 hours.** Supplements French 104, 105 and 106. Oral practice in the development of elementary conversational skill and the improvement of pronunciation. Prerequisites: Fr. 103 or two years of high school French and concurrent enrollment in Fr. 104, 105, or 106. F, W, S
114. **Intermediate French—Conversation Option I. 4 hours.** May be substituted for French 104. Satisfies the graduation requirement in the College of Liberal Arts and Sciences if taken with French 115 and 116. Practice in speaking French. Note: Does not serve as a prerequisite for any 200-level courses in French unless the student passes the French 106 proficiency examination. Prerequisite: Fr. 103 or two years of high school French or the equivalent. F, W, S
115. **Intermediate French—Conversation Option II. 4 hours.** May be substituted for French 105. Satisfies the graduation requirement for the College of Liberal Arts and Sciences if taken with French 116. Practice in speaking French. Note: Does not serve as a prerequisite for any 200-level courses in French unless the student passes the French 106 proficiency examination. Prerequisite: Fr. 114 or the equivalent. F, W, S
116. **Intermediate French—Conversation Option III. 4 hours.** May be substituted for French 106. Satisfies the graduation requirement in the College of Liberal Arts and Sciences. Practice in speaking French. Note: Does not serve as a prerequisite for any 200-level courses in French unless the student passes the French 106 proficiency examination. Prerequisite: Fr. 115 or the equivalent. F, W, S

121. **Elementary French, Honors Course.** 5 hours. Grammar, pronunciation, reading, composition, conversation. Open only to James Scholars and others with superior linguistic ability. Completion of French 121, 122, and 123 leads directly to French 105. Practice in the language laboratory is required. Prerequisite: Approval of the department. F
122. **Elementary French, Honors Course.** 5 hours. Continues French 121. Practice in the language laboratory is required. Prerequisite: Fr. 121. W
123. **Elementary French, Honors Course.** 5 hours. Continues French 122. Practice in the language laboratory is required. Prerequisite: Fr. 122. S
186. **Masterpieces of French Literature in English Translation.** 4 hours. Same as Humanities 186. Not open to students majoring or minoring in French. Reading of selected works from the seventeenth century to the present day. S
201. **Introduction to French Literature I.** 3 hours. Reading of selected masterpieces. Prerequisite: Fr. 106 or four years of high school French. F, W, S
202. **Introduction to French Literature II.** 3 hours. Continues French 201. Prerequisite: Fr. 106 or four years of high school French. F, W, S
203. **Introduction to French Literature III.** 3 hours. Continues French 202. Prerequisite: Fr. 106 or four years of high school French. F, W, S
209. **Conversation I.** 3 hours. Conversational practice to develop oral facility; exercises for the improvement of pronunciation and diction. Practice in the language laboratory is required. Prerequisite: Fr. 106 or four years of high school French. F, W
210. **Conversation II.** 3 hours. Continues French 209. Practice in the language laboratory is required. Prerequisite: Fr. 209. W, S
211. **Composition.** 3 hours. Training in writing French, translation from English, free composition. Prerequisite: Fr. 106 or four years of high school French. F, W, S, Su
212. **Syntax.** 3 hours. Advanced study of rules of French grammar; special attention to the analysis of sentence structure. Exercises in advanced composition. Prerequisite: Fr. 211 or consent of the instructor. W, S
213. **French Phonetics.** 3 hours. Two hours per week in the language laboratory are required. The International Phonetic Alphabet as applied to the French sound system. French pronunciation, intonation, rhythm and stress are analyzed and practiced. Prerequisite: Fr. 106 or the equivalent. F, W
241. **Social and Cultural History.** 3 hours. Social thought and the fine arts as background for the study of French literature. Prerequisites: Fr. 201, 202, and 203 or the equivalents. W

261. **French Civilization I.** 4 hours. Same as Humanities 261. History of French civilization from the end of the Middle Ages to the end of the Wars of Religion, considered in the light of changes that were typical for all of western Europe. The literature, religious thought, art, and sciences of this period are viewed against the background of political and social change. Prerequisite: Sophomore standing or consent of the instructor. For French majors: Fr. 201, 202, and 203 or the equivalents. F
262. **French Civilization II.** 4 hours. Same as Humanities 262. Social, political, and religious changes in the seventeenth and eighteenth centuries studied through the literature of the classical period and the French Enlightenment. Prerequisite: Sophomore standing or consent of the instructor. For French majors: Fr. 201, 202, and 203 or the equivalents. W
263. **French Civilization III.** 4 hours. Same as Humanities 263. The ideological struggles and social-political changes of the nineteenth and twentieth centuries in France as seen through the novels, memoirs, histories, and social tracts of the period. Prerequisite: Sophomore standing or consent of the instructor. For French majors: Fr. 201, 202, and 203 or the equivalents. S
281. **Introduction to Linguistics.** 3 hours. French phonology, morphology, syntax, and semantics in comparison with English. Prerequisites: Fr. 210, 211, and 213.
282. **Teachers Course.** 3 hours. Resources, classroom materials, standard practices, and problems in the teaching of French; practical application to actual classroom situations. Prerequisites: Junior standing and Fr. 281 or consent of the instructor. F
291. **Student-Initiated Course.** 1 to 4 hours. May be repeated. The amount of credit toward satisfying specific department requirements is contingent on the approval of the department committee. Special experimental seminar on topics not treated by regular course offerings. Students must activate this course themselves by directing their requests to the head of the department. Prerequisite: Fr. 106 or the equivalent. F, W, S, Su
299. **Tutorial Course.** 3 to 6 hours. Credit may be 3 hours, or 6 hours by permission of the department head, or the course may be repeated for a maximum of 6 hours. For seniors majoring in French; supplements regular courses. Prerequisites: Senior standing and approval of the department. S, Su
313. **Stylistics I (Prose).** Undergraduate credit, 3 hours; graduate, 4 hours. Detailed analysis of the style of selected French authors; practice in advanced composition. Prerequisite: Fr. 211 or consent of the instructor. S
314. **Stylistics II (Poetry).** Undergraduate credit, 3 hours; graduate, 4 hours. Detailed analysis of the style of selected French authors; practice in advanced composition. Prerequisite: Fr. 211 or consent of the instructor. F
317. **Modern French Drama I.** Undergraduate credit, 3 hours; graduate, 4 hours. Major dramatists of the nineteenth and twentieth centuries. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. F

318. **Modern French Drama II.** Undergraduate credit, 3 hours; graduate, 4 hours. Continues French 317. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. W
319. **Modern French Drama III.** Undergraduate credit, 3 hours; graduate, 4 hours. Continues French 317 and 318. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. S
321. **French Literature of the Middle Ages I.** Undergraduate credit, 3 hours; graduate, 4 hours. From the origins to 1300; texts in modern French. Prerequisites: Fr. 201, 202, and 203 or the equivalents. F
322. **French Literature of the Sixteenth Century.** Undergraduate credit, 3 hours; graduate, 4 hours. Major writers, to be read in modern French. Prerequisites: Fr. 201, 202, and 203 or the equivalents. F
323. **French Classical Literature I.** Undergraduate credit, 3 hours; graduate, 4 hours. Major French prose writers of the seventeenth century, excluding novelists. Prerequisites: Fr. 201, 202, and 203 or the equivalents. W
324. **French Classical Literature II.** Undergraduate credit, 3 hours; graduate, 4 hours. Major dramatists of the seventeenth century. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. F
325. **French Literature of the Eighteenth Century I.** Undergraduate credit, 3 hours; graduate, 4 hours. Major writers (except the dramatists). Prerequisites: Fr. 201, 202, and 203 or the equivalents. F
326. **French Literature of the Eighteenth Century II.** Undergraduate credit, 3 hours; graduate, 4 hours. Major dramatists. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. W
327. **French Poetry I.** Undergraduate credit, 3 hours; graduate, 4 hours. Major poets from the fourteenth through the eighteenth centuries. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. W
328. **French Poetry II.** Undergraduate credit, 3 hours; graduate, 4 hours. Major poets of the nineteenth and early twentieth centuries. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. S
329. **French Poetry III.** Undergraduate credit, 3 hours; graduate, 4 hours. Major poets of the twentieth century. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. S
331. **The French Novel of the Nineteenth Century I.** Undergraduate credit, 3 hours; graduate, 4 hours. Major novelists. Prerequisites: Fr. 201, 202, and 203 or the equivalents. F
332. **The French Novel of the Nineteenth Century II.** Undergraduate credit, 3 hours; graduate, 4 hours. Major novelists. Prerequisites: Fr. 201, 202, and 203 or the equivalents. W

333. **The French Novel of the Nineteenth Century III.** Undergraduate credit, 3 hours; graduate, 4 hours. Major novelists. Prerequisites: Fr. 201, 202, and 203 or the equivalents. S
337. **The French Novel of the Twentieth Century I.** Undergraduate credit, 3 hours; graduate, 4 hours. Reading and analysis of selected novels from 1900 to 1940. Prerequisite: Fr. 201, 202, and 203 or the equivalents. F
338. **The French Novel of the Twentieth Century II.** Undergraduate credit, 3 hours; graduate, 4 hours. Reading and analysis of selected novels from 1940 to the present. Prerequisites: Fr. 201, 202, and 203 or the equivalents. W
340. **Introduction to Afro-French Literature.** Undergraduate credit, 3 hours; graduate, 4 hours. Selected prose and poetry of sub-Sahara African Francophone literature. Prerequisites: Fr. 201, 202, and 203. W
341. **French Literature of the Middle Ages II.** Undergraduate credit, 3 hours; graduate, 4 hours. French literature in the fourteenth and fifteenth centuries; texts in modern French. Prerequisites: Fr. 201, 202, and 203 or the equivalents. W
342. **The *Pleiade*.** Undergraduate credit, 3 hours; graduate, 4 hours. Theory and practices of the *Pleiade* poets. Prerequisites: Fr. 201, 202, and 203 or the equivalents. W
343. **French Classical Literature III.** Undergraduate credit, 3 hours; graduate, 4 hours. Major French poets of the seventeenth century. Prerequisites: Fr. 201, 202, and 203 or the equivalents. S
345. **Montaigne: His *Essais* and His Age.** Undergraduate credit, 3 hours; graduate, 4 hours. Detailed study of Montaigne's life, thought, and times as reflected in the *Essais*. Prerequisites: Fr. 201, 202, and 203 or the equivalents. S
349. ***La Bataille Romantique*.** Undergraduate credit, 3 hours; graduate, 4 hours. Manifestos, polemical writings, and major literary productions of the period. Prerequisites: Fr. 201, 202, and 203. W
350. **Pre-Romanticism.** Undergraduate credit, 3 hours; graduate, 4 hours. The pre-Romantic movement in France from 1761 to 1814. Prerequisites: Fr. 201, 202, and 203 or the equivalents. F
351. **French Romanticism I.** Undergraduate credit, 3 hours; graduate, 4 hours. Reading and analysis of selected works tracing the main developments in the Romantic movement from 1815 to 1829. Prerequisites: Fr. 201, 202, and 203 or the equivalents. W
352. **French Romanticism II.** Undergraduate credit, 3 hours; graduate, 4 hours. Reading and analysis of selected works tracing the main development in the Romantic movement after 1830. Prerequisites: Fr. 201, 202, and 203 or the equivalents. S
355. **Literary and Intellectual Currents of the Eighteenth Century.** Undergraduate credit, 3 hours; graduate, 4 hours. Reading and analysis of selected works tracing

major literary and intellectual currents. Prerequisites: Fr. 201, 202, and 203 or the equivalents. F

360. **Major Trends in French Literature.** Undergraduate credit, 3 hours; graduate, 4 hours. Selected writings to illustrate major trends instrumental in the formation of critical and aesthetic principles of French literature. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. F
361. **History of the French Language.** Undergraduate credit, 3 hours; graduate, 4 hours. From its origins to the present. Prerequisites: Fr. 212, and 313 or 314 or the equivalent. S
362. **The French Novel from 1600 to 1715.** Undergraduate credit, 3 hours; graduate, 4 hours. Reading and analysis of selected novels of the period. Prerequisites: Fr. 201, 202, and 203 or consent of the instructor. W
363. **The French Novel from 1715 to 1789.** Undergraduate credit, 3 hours; graduate, 4 hours. Reading and analysis of selected novels of the period. Prerequisites: Fr. 201, 202, and 203 or the equivalents or consent of the instructor. S
364. **Short Prose Fiction.** Undergraduate, 3 hours; graduate, 4 hours. French prose narrative forms, excluding the novel, from the Renaissance to the present. Prerequisites: For French majors, Fr. 201, 202, and 203 or the equivalents. S

GEOGRAPHY (Geog)

101. **Physical Geography I: Landforms and Mineral Resources.** 4 hours. The earth and its resources; the earth grid and its portrayal on maps; interpretation of landforms from a geographic point of view; occurrence and use of mineral resources. F, W, S, Su
102. **Physical Geography II: Earth-Sun Relations and Elements of Weather.** 4 hours. Planetary relations; the atmosphere, its composition, function, and behavior in the production of weather types; airmasses and air mass analysis. F, W, S, Su
103. **Physical Geography III: Climate, Vegetation, and Soils.** 4 hours. Climatic types and climatic regions; factors that give order and logic to their areal distribution; biotic and edaphic types and regions in relation to climatic phenomena. Prerequisite: Geog. 102. F, W, S
110. **Cultural Geography I.** 4 hours. Introduction to the geographic patterns created by man's efforts to survive within his environmental constraints. Attention is given to man's origin, divergence, and convergence in historical perspective. Special reference is made concerning man himself as well as to the manifestations on the earth's surface of his varied attitudes, objectives, and technical skills.
111. **Cultural Geography II.** 4 hours. Continues Geography 110. Special reference to man's procurement of food, shelter and clothing, communications, and increased urbanism and the consequences of these phenomena and processes. Prerequisite: Geog. 110.

130. **World Patterns of Production.** 4 hours. Man's utilization of the major economic resources of the world from the standpoint of geographic patterns and the utilization of resources.
160. **World Regional Geography.** 5 hours. Geographic structure of the world; regional patterns of settlement and land utilization of resources.
163. **Geography of Illinois.** 3 hours. Detailed regional study of the state; special emphasis on the cultural relations of Illinois to the rest of the nation. Prerequisite: One course in geography or consent of the instructor.
182. **Introduction to Social Science Research Methods.** 4 hours. Same as Sociology 185. The application of statistical methods in social science. Topics include research design and the role of statistics in sociological investigation, measures of central tendency and dispersion, simple correlation techniques, contingency analysis, interpretation of survey findings, and introduction to statistical inference. One hour per week of laboratory work in data analysis. Prerequisite: Soc. 100, or 8 hours of geography or sociology, or consent of the instructor.
185. **Basic Maps and Graphics.** 4 hours. Introductory course on the use of maps and other graphic materials. Demonstration and evaluation of slides, films, prints, models, and maps for teaching and other purposes. Prerequisite: Declared major in a teacher education program.
190. **Concepts in Geography.** 4 hours. Basic geographic concepts, including the notions of spatial distributions, areal association, spatial interaction, and regionalism.
197. **Freshman Honors Seminar II.** 2 hours. Regional analysis of the lower Mekong; physical and cultural landscapes; people and economy; problems of industrialization and political stability; the region as an illustration of an emerging area. Prerequisite: James Scholar or other honors status.
201. **Landform Geography of the United States.** 4 hours. The variation of the earth's surface form in the United States and the related distributional aspects of geomorphic processes, vegetation, and soils. Readings and individual projects are required. Prerequisite: Geog. 101 or consent of the instructor.
203. **Climates of the Continents.** 4 hours. The world's climates; controls and distribution; problems of classification and regional analysis. Prerequisite: Geog. 103 or consent of the instructor.
209. **Introduction to Astronomy.** 4 hours. Same as Physics 209. An introductory and essentially non-mathematical course for superior students who are not science majors. Prerequisite: Consent of the instructor.
210. **Advanced Cultural Geography.** 4 hours. Human responses to the earth's environment. Major geographic problems in cultural areas and distributions, cultural origins and dispersals, cultural landscapes, and cultural ecology. Prerequisite: Geog. 111 and 130 or 12 hours of either anthropology, economics, history, political science, or sociology.

215. **Historical Geography of the United States and Canada.** 4 hours. Regional analysis of the effects of climate, soils, water bodies, and topography on the settlement of the continent; their relationship to present sectional differences; the correlation of history and geography is stressed. Prerequisites: Geog. 111 and 130; or Geog. 260; or Hist. 151.
217. **World Political Patterns.** 4 hours. World pattern of nations in relation to their natural environment; population and economic factors in world affairs; emphasis on regional concepts and problems of the non-Western world. Prerequisites: Geog. 111 and 130, or 12 hours of political science.
230. **Areal Organization of Activities.** 4 hours. Models relating to the spatial elements of activities with application to urban and regional growth and development. Prerequisites: Geog. 111 and 130; or 12 hours of either anthropology, economics, history, political science, or sociology.
231. **Agricultural Regions and Land Utilization.** 4 hours. The nature of land utilization from the world, continental, and regional viewpoints; the types of agricultural land use; the interrelationships between areas of different types of land use. Prerequisite: Geog. 111 and 130; or 12 hours of either anthropology, economics, history, political science, or sociology.
233. **Manufacturing Regions of the World.** 4 hours. World distribution of manufacturing industries. The relative importance of industry in the major economies of the world; factors in the location of principal types of manufacturing; detailed analysis of selected industrial districts. Prerequisites: Geog. 111 and 130; or 12 hours of either anthropology, economics, history, political science, or sociology.
235. **Geographic Aspects of Transportation.** 4 hours. Principles; world patterns of land, air, and sea transportation routes, facilities, and traffic; relations of transportation to regional development; selected problems in the geographic aspects of railway, highway, and pipeline transportation. Individual projects and readings are assigned. Prerequisites: Geog. 111 and 130 or 12 hours of either anthropology, economics, history, political science, or sociology.
236. **Management and Conservation of Resources.** 4 hours. Introduction to natural resource problems arising from the growth of population, change in taste and technology, and concern with the quality of the environment. Individual readings and projects are assigned. Prerequisites: Geog. 111 and 130 or 12 hours of either anthropology, economics, history, political science, or sociology.
251. **Introduction to the Geography of Cities.** 4 hours. World cities and comparative urbanization. Intensive exposure to the development and pattern of urbanization; the growth of major integrating centers of political and economic power; the world cities. Prerequisites: Geog. 101, 102, 103 or 111 and 130.
260. **Anglo-America.** 4 hours. Survey of the principal economic activities in each of the major regions of North America from the standpoint of their relations to the natural environment and to the other major regions. One Saturday field trip may be required. Prerequisites: Geog. 101, 102, and 103 or 111 and 130 or 160.

262. Middle America. 4 hours. Physical landscapes and the human cultural, economic, and political responses to them in Mexico, Central America, and the West Indies. Prerequisites: Geog. 101, 102, and 103 or 111 and 130 or 260.
263. South America. 4 hours. Regional geography; physical regions, people, economic resources, and political alignments. Prerequisites: Geog. 101, 102, and 103 or 111 and 130 or 260.
264. Western Europe. 4 hours. A regional analysis of the economic, social, and political development of people in relation to the location of Europe and its natural regions and the physical elements of land relief, climate, soil, and other natural resources. Emphasis on Britain, France, and Germany. Prerequisites: Geog. 101, 102, and 103 or 111 and 130 or 260.
265. The U.S.S.R. 4 hours. Physical and cultural landscapes; regional analysis of resources and economy; the geographic basis of the nation's role in world affairs. Prerequisites: Geog. 101, 102, and 103 or 111 and 130 or 160.
266. Eastern Asia. 4 hours. Physical and cultural landscapes of China, Japan, and Korea; physical regions, people, economy, and political alignments. Prerequisite: Geog. 101, 102, and 103 or 111 and 130 or 260.
267. Southern and Southeastern Asia. 4 hours. Physical and cultural landscapes; physical regions, people, mineral wealth, agricultural production, manufacturing, trade, political alignments. Prerequisites: Geog. 101, 102, and 103 or 111 and 130 or 260.
268. Africa, South of the Sahara. 4 hours. Regional analysis of the relationship between natural resources, economic development, and the evolution of the many political units. Prerequisites: Geog. 101, 102, and 103 or 111 and 130 or 260.
280. Field Geography. 4 hours. Field techniques based on observation of physical and cultural landscapes of the Chicago metropolitan area, northern Illinois, and southern Wisconsin. Class meets on seven selected Saturdays from 8 a.m. to 4 p.m. Prerequisites: Geog. 190, one two-course sequence, and either Geog. 101, 102, 103 or 111 and 130, or consent of the instructor. F
285. A Problematic Approach to Cartography. 4 hours. Introduction to the problems and practices of cartographic display of areal data. Topics include characteristics of maps, symbolization, and the introduction of some potentials for computer usage in map preparation. Prerequisites: Geog. 190, one two-course systematic sequence, and either Geog. 101, 102, 103, or 111 and 130, or consent of the instructor.
286. Map Interpretation. 4 hours. Historical development of maps; survey of selected United States and foreign map series; evaluation of map components; critical analysis of data portrayal schemes; methods of making measurements on maps. Prerequisites: Geog. 190 or the equivalent, one 12-hour introductory sequence, and one 8-hour upper-division systematic sequence.

287. **Aerial-Photo Interpretation.** 4 hours. The aerial photograph as a geographic research tool. Applications of data gathering techniques to problems involving agriculture, ecology, forestry, geology, industry, pollution, and urban land use. Prerequisites: Geog. 190 or the equivalent, one 12-hour introductory sequence, and one 8-hour upper-division systematic sequence.
301. **Fundamentals of Landform Analysis.** 3 hours. Theories of landform processes and techniques of analysis. Prerequisite: Geog. 101 or GeolS. 102 or consent of the instructor.
303. **Principles of Climatology.** 4 hours. Climatology; macroclimatology and microclimatology; particular emphasis on fluxes of energy and mass at the interfaces between the earth's surface and the atmosphere. The environment and man, plants, and animals; special emphasis on urban microclimatological problems. Prerequisites: Geog. 101, 102, and 103.
311. **Geography of Population.** 4 hours. Broad treatment of the problems created by the changing distributions and numbers of the world's population. Emphasis on the relationships between population and resources; intensive study of the implications for both overpopulated and underpopulated areas of the world. Prerequisites: Geog. 190 and 210.
312. **Geography of Religions.** 4 hours. Systematic treatment of geographical manifestations of the major religious systems of the world. Special attention to the geographical origins and dispersal mechanisms of religious systems and to the manner in which man organizes his life within the framework of his belief. Intensive study of applications being made in the geographical inquiry of religious systems. Prerequisites: Geog. 190 and 210.
330. **Location Theory and Spatial Analysis.** 4 hours. Spatial analysis in relation to theories of location of economic activity and regional development. Theoretical systems; development and derivation of locational patterns of agricultural, manufacturing, and tertiary activities. Prerequisites: Geog. 190 and one course chosen from Geog. 230, 231, 233, or 235 or Econ. 121 or Mktg. 360.
336. **Decision Making and Resource Management.** 4 hours. The nature of decision making schema in resource management; classifying problems according to elements that may enter into decisions in the management of natural resources. Emphasis on attitudes on environmental quality and human adjustment to natural hazard. Prerequisites: Geog. 190 and 236.
350. **Areal Organization of Urban Systems I.** 4 hours. Geographic aspects of intracity relationships. Topics include the city as a complex man-machine system, and areal patterns of urban growth and development within the context of cross-sectional and longitudinal models. Prerequisite: Geog. 251 or 330 or one course from Geog. 260 through 268.
351. **Areal Organization of Urban Systems II.** 4 hours. Geographic aspects of intercity relationships. Topics include patterns of intercity flows and development, continuous and hierarchical ordering of urban places, measurement of areal align-

ments, and the theoretical implications of different types of areal patterns. Prerequisite: Geog. 350 or consent of the instructor.

365. **Interregional Exchange Dynamics.** 4 hours. Spatial analysis of the economic, social, and political facts that have resulted from, and in, human and commodity flows among regions; special attention to the important relationships resulting from regional differences. Prerequisites: Geog. 311 or 330 or 190 and either 230, 231, 233, or 235; or Econ. 121 or Soc. 271.
371. **Urban Geography.** 4 hours. Distribution of cities; urban patterns, forms, and functions; classification of urban centers and tributary areas; systems of urban land classification; forces affecting urban land uses; the geographic aspects of city planning. Prerequisite: Junior standing.
380. **Field Geography of Western Europe.** 12 hours. Field observation and analysis of physical environments and human response from the North European Plain to the Mediterranean Sea; physical regions, people, and economic life. Two weeks on campus; seven weeks in Europe. Individual term projects. Prerequisites: One year of geography and consent of the instructor.
381. **Geographic Information Systems I.** 3 hours. Problems encountered in the gathering and use of geographic data and the structuring of research within the light of existing relevant theory measurement systems capabilities; and recognized objectives of research activities. Topics include review of data sources, methods of measurement, sampling models, and problems of dealing with aggregated reporting units, records matching, and missing data. Prerequisites: 12 hours of geography (excluding Geog. 101 through 105) and Math. 117 or Soc. 100 and 185 or QM 272.
382. **Geographic Information Systems II.** 4 hours. Application of inferential statistical techniques and probability models in geographic research. Topics include use of descriptive parameters in recognizing geographic relationships, tests of significance, and recognition of particular areal patterns. Prerequisite: Geog. 381 or consent of the instructor.
383. **Geographic Information Systems III.** 4 hours. Problems encountered in the management and portrayal of geographic data. Topics include preparation of data for manual and machine processing, data condensation and characterization, observation indexing, and the preparation of graphic and tabular displays. Prerequisite: Geog. 382 or consent of the instructor.
386. **Introduction to Areal Patterns.** 4 hours. Introduction to the characteristics and evaluation of selected real-world patterns. Application of the notions of randomness and interdependence to the problem of understanding certain of the physical and cultural processes affecting the arrangement of objects in the landscape. Prerequisites: Geog. 382, or similar course in another discipline, and consent of the instructor.
387. **Remote Sensing of the Environment.** 4 hours. Principles and practice in interpretation of aerial photographs, radar, and infrared imagery. Knowledge of elemen-

tary physics and geometry is recommended. Prerequisites: Geog. 287 and consent of the instructor.

391. **Review of Geographic Thought and Research Methods.** 4 hours. Introduction to the theory and technique of geographic research; modern geographic philosophy; interpretative analysis of bibliographic sources and the preparation of a bibliography; preparation and evaluation of individual papers on selected topics. Prerequisites: Two 2-course systematic sequences: one upper-division research methods course, one 300-level urban or regional course; and consent of the instructor.
399. **Special Studies in Geography.** 2 to 5 hours. May be repeated twice for credit for a total of 10 hours. Readings and reports in selected fields chosen in consultation with the instructor. Prerequisites: Senior standing and consent of the instructor.

GEOLOGICAL SCIENCES (GeolS)

101. **Principles of Geology I.** 4 hours. Analysis of the earth's surficial features: weathering and erosion, soils, groundwater, glaciers, streams, oceans and shorelines, deserts. Half-day Saturday field trip required.
102. **Principles of Geology II.** 4 hours. The origin, age, and composition of the earth; introduction to rocks and minerals; metamorphism, magmatic evolution, isostasy, earthquakes, geophysical considerations of the earth's interior.
103. **Principles of Geology III.** 4 hours. Geologic history and evolution of the earth and its life; geosynclinal theory, uniformitarianism, methods of interpreting earth history. One-day Saturday field trip required. Prerequisites: GeolS. 101 and 102 or consent of the instructor.
110. **Field Work.** 3 hours. Observation in the St. Francois Mountains and adjacent parts of Missouri and Illinois. Registration, winter quarter; two three-hour class meetings, held during spring vacation. Credit is given on completion of a satisfactory written report. Prerequisite: GeolS. 102 or 150 or PSci. 103.
111. **Principles of Geology.** 1 hour. For honors students. May be taken three times, each time with concurrent registration in Geological Sciences 101, 102, or 103 or once with concurrent registration in Geological Sciences 150. Prerequisites: Concurrent registration in the honors section of GeolS. 101, 102, 103 or 150 or consent of the instructor.
122. **Natural Sciences—The Evolving Earth in Its Universal Setting.** 4 hours. Same as Natural Sciences 122. Origin of the universe and elements, solar system, and earth-moon pair; history and processes of the earth's evolution. Prerequisite: NatS. 121 or consent of the instructor.
150. **Geology for Engineers.** 4 hours. Application of elementary geology to engineering. Prerequisite: Sophomore standing in the College of Engineering.

204. Crystallography. 4 hours. Morphological, optical, and introductory structural crystallography; features of mineralogical significance. Prerequisite: One quarter of college chemistry.
205. Mineralogy. 4 hours. Origin and properties of common minerals. Crystal chemistry of major mineral groups. Laboratory study and identification of minerals and rocks. Prerequisite: GeolS. 204 or the equivalent.
206. Petrology. 4 hours. Origin, occurrence, and chemical characteristics of igneous and metamorphic rocks. Introduction to phase equilibria. Laboratory emphasizes application of petrographic and X-ray diffraction techniques to problems of rock genesis. Prerequisite: GeolS. 205.
218. Introduction to Paleontology. 4 hours. Same as Biological Sciences 218. The phylogeny, morphology, and ecology of fossils; emphasis on the invertebrates. Two or three Saturday field trips are required. Prerequisite: One year of biological sciences or consent of the instructor.
219. Stratigraphy and Sedimentation I. 4 hours. Origin, description, and interpretation of sedimentary rocks. Prerequisite: GeolS. 103.
220. Stratigraphy and Sedimentation II. 4 hours. Continues Geological Sciences 219.
230. Introduction to Oceanography. 4 hours. A physical description of the marine environment; physical and chemical properties of sea water; currents, wave action, tidal forces, geography and geology of the ocean basins. Relation of the marine organism to the physical environment. Prerequisite: Consent of the instructor.
235. Astrogeology. 4 hours. Data and major theories of the origin and evolution of the universe, solar system, and earth; lunar geology, meteors and meteorites, artificial satellite data. Prerequisite: GeolS. 103 or consent of the instructor.
240. Economic Geology. 4 hours. Principles and techniques of mineral exploration, evaluation, and exploitation. Origin and occurrence of economic mineral materials, including petroleum and natural gas. Prerequisite: Consent of the instructor.
299. Introduction to Research. Credit to be arranged. Independent study. Each student who desires to register must present to the head of the department a written statement from the instructor under whom he is to work. Only those students who write a thesis are recommended for graduation with departmental distinction. Prerequisite: Consent of the instructor.
303. Advanced Physical Geology I. 4 hours. The physical nature of the earth; the manner in which the materials of the earth determine structure; description of earth structures and structural processes; techniques of structural analysis. Prerequisites: GeolS. 103, 206, and consent of the instructor.
304. Advanced Physical Geology II. 4 hours. Problems in earth chemistry, physics, and history. Prerequisite: GeolS. 303.

316. **Invertebrate Paleontology.** 4 hours. Same as Biological Sciences 316. Phylogeny, morphology, and ecology of the fossil invertebrates. Prerequisites: GeolS. 218 and consent of the instructor.
317. **Field Geology in the Rocky Mountains.** 12 hours. Conducted from a locality in the Rocky Mountains. Field Training in stratigraphy, structure, and geomorphology; geologic mapping with plane table and serial photographs. Approximate cost \$250 to \$305. Prerequisite: GeolS. 103 and 206 or consent of the instructor.
318. **Vertebrate Paleontology.** 4 hours. Same as Biological Sciences 318. Phylogeny, morphology, and ecology of the fossil vertebrates. Prerequisites: One year of biological sciences and consent of the instructor.
319. **Paleobotany.** 5 hours. Same as Biological Sciences 319. Structure, phylogeny, and stratigraphic distribution of representative fossil plants. Lecture, laboratory, and field trips. Prerequisite: One year of biological sciences.
335. **Geochemistry.** 4 hours. Principles of the distribution of the elements in the earth's crust. Element partitioning between coexisting minerals; origin of the elements. Introduction to thermodynamic considerations of mineral equilibria. Prerequisites: Chem. 112, 113, and 114 or consent of the instructor.
345. **Advanced Crystallography.** 4 hours. Crystalline properties of minerals. Theory and practice of determining the crystalline structure of minerals. Prerequisite: GeolS. 205 or consent of the instructor.
350. **Hydrogeology.** 4 hours. The occurrence, storage, movement, and quality of water in rocks of the earth's crust. Prerequisites: GeolS. 103, 220, credit or concurrent registration in Math. 133, or consent of the instructor.
360. **Introductory Geophysics.** 4 hours. The shape and figure of the earth, gravity, seismology, and magnetism. Thermodynamics of the earth; atmospheric and planetary geophysics. Prerequisite: Consent of the instructor.
365. **Statistical Methods in Geology.** 4 hours. Introductory course. Sampling from geological populations, statistical inference, and hypothesis testing; statistics of orientation data; trend surface methods; multivariate correlation techniques; time series analysis. Prerequisite: Math. 370 or consent of the instructor.
370. **Engineering Geology.** 4 hours. Applications of geology to major engineering problems and operations. Prerequisites: GeolS. 150, 206, Math. 132, and Phys. 144 or consent of the instructor.

GERMAN (Ger)

100. **Elementary German, Special Course.** 4 hours. A one-quarter review course for students who have had high school German, but whose scores on the placement test indicate that their previous preparation is too weak for German 104 and too strong for German 101. Open also to transfer students who have had no more

than one year of college German and whose scores on the placement test indicate that their previous preparation is too weak for German 104 or 107. This course is followed by German 104, 105, and 106 or 107, 108, 109, 110, 111, and 112 in sequence. Prerequisite: German placement test. W, S, Su, F

101. **Elementary German I. 4 hours.** Four class meetings per week plus language laboratory experience. A non-intensive sequence designed primarily to satisfy the foreign language requirement, but open to all students. Introduction to and practice in speaking, understanding, reading, and writing. W, S, Su, F
102. **Elementary German II. 4 hours.** Continues German 101. Prerequisite: Ger. 101 or 121 or the equivalent. W, S, Su, F
103. **Elementary German III. 4 hours.** Continues German 101 and 102. Prerequisite: Ger. 102 or 122 or the equivalent. W, S, Su, F
104. **Intermediate German I. 4 hours.** A non-intensive sequence designed primarily to satisfy the foreign language requirement, but open to all students. Continues practice in speaking, understanding, reading, and writing. Prerequisite: Ger. 100 or 103 or 123 or the equivalent. W, S, Su, F
105. **Intermediate German II. 4 hours.** Continues German 104. Prerequisite: Ger. 104 or 124 or the equivalent. W, S, Su, F
106. **Intermediate German III. 4 hours.** Continues German 104 and 105. Prerequisite: Ger. 105 or 125 or the equivalent. W, S, Su, F
107. **Reading German I. 4 hours.** Reading modern German prose. One of the options in fulfillment of the second-year foreign language requirement in German. Prerequisite: Ger. 100 or 103 or the equivalent. W, S, F
108. **Literary Readings. 4 hours.** Continues German 107. Concentration on reading skills in prose fiction. Prerequisite: Ger. 107 or the equivalent. W, S, F
109. **Nonfiction Readings. 4 hours.** Continues Ger. 107. Concentration on reading skills in nonfiction. Prerequisite: Ger. 107 or the equivalent. W, S, F
110. **Advanced Literary Readings. 4 hours.** Continues German 108. Advanced reading in prose fiction. Prerequisite: Ger. 108 or 109. W, S, F
111. **Advanced Nonfiction Readings. 4 hours.** Continues German 109. Prerequisite: Ger. 108 or 109. W, S, F
112. **Scientific Readings. 4 hours.** Concentration on readings in scientific German. Prerequisite: Ger. 108 or 109. W, S, F
113. **Conversation and Composition I. 2 hours.** Not open to students with a level of proficiency matching that acquired in German 201. Need not be taken in sequence. German 113 and either 114 or 115 may be taken in lieu of German 106, 110, 111, or 112 to satisfy foreign language requirements. Prerequisite: Ger. 100, 103, or the equivalent. F

- 114. Conversation and Composition II. 2 hours.** Not open to students with a level of proficiency matching that acquired in German 201. Need not be taken in sequence. German 114 and either 113 or 115 may be taken in lieu of German 106, 110, 111, or 112 to satisfy foreign language requirements. Prerequisite: Ger. 100, 103, or the equivalent. W
- 115. Conversation and Composition III. 2 hours.** Not open to students with a level of proficiency matching that acquired in German 201. Need not be taken in sequence. German 115 and either 113 or 114 may be taken in lieu of German 106, 110, 111, or 112 to satisfy foreign language requirements. Prerequisite: Ger. 100, 103, or the equivalent. S
- 121. Elementary German I. 5 hours.** Four class meetings per week plus language laboratory experience. A more intensive sequence to satisfy the foreign language requirement, designed primarily for German majors, minors, teaching majors, James Scholars (counts as honors course), and other students with special aptitude and interest in language. Introduction to and practice in speaking, understanding, reading, and writing. Prerequisite: Satisfactory score on Linguistic Aptitude Test (administered in class during the first week of the quarter). F
- 122. Elementary German II. 5 hours.** Continues German 121. Prerequisite: Ger. 121, or 101 with a grade of A or B, or approval of the department. W
- 123. Elementary German III. 5 hours.** Continues German 121 and 122. Prerequisite: Ger. 122, or 102 with a grade of A or B, or approval of the department. S
- 124. Intermediate German I. 5 hours.** Four class meetings per week plus language laboratory experience. A more intensive sequence to satisfy the foreign language requirement, designed primarily for German majors, minors, teaching majors, James Scholars (counts as honors course), and other students with special aptitude and interest in language. Continues practice in speaking, understanding, reading, and writing. Prerequisite: Ger. 123, or 100 or 103 with a grade of A or B, or approval of or placement by the department. F
- 125. Intermediate German II. 5 hours.** Continues German 124. Prerequisite: Ger. 124, or 104 with a grade of A or B, or approval of the department. W
- 126. Intermediate German III. 5 hours.** Continues German 124 and 125. Prerequisite: Ger. 125, or 105 with a grade of A or B, or approval of the department. S
- 185. Masterpieces of German Literature in English Translation. 4 hours.** Same as Humanities 185. Not open to German majors. Satisfies general education requirement in humanities when taken in sequence with French 185 and Spanish 185. W
- 190. Franz Kafka. 4 hours.** Given in English. Major works and selections from the short stories, letters, and diaries. F
- 191. Bertolt Brecht. 4 hours.** Major works in English translation. W
- 192. Hermann Hesse. 4 hours.** Major works in English translation. S

195. **Goethe's Works in Translation.** 4 hours. *Faust* and other representative writings in English translation. S
201. **Writing and Speaking German I.** 4 hours. Phonetics, grammar, syntax, vocabulary development; training in oral and written communication. Prerequisite: Ger. 106 or the equivalent. W, F
202. **Writing and Speaking German II.** 4 hours. Continues German 201. Prerequisite: Ger. 201 or the equivalent. W, S
203. **Writing and Speaking German III.** 4 hours. Continues German 202. Prerequisite: Ger. 202 or the equivalent. S, F
204. **Writing and Speaking German IV.** 4 hours. Continues German 203. Prerequisite: Ger. 203 or the equivalent. F
206. **Corrective German Phonetics.** 1 hour. May be repeated once for credit. Pronunciation and intonation practice. Prerequisite: Ger. 106 or the equivalent. W, S, F
207. **German Grammar for Teachers.** 4 hours. Intensive study and review of problems of German grammar and syntax. Prerequisite: Ger. 204 or the equivalent or consent of the instructor.
219. **Thomas Mann.** 4 hours. Given in English. A detailed study of the three major novels and selections from the short stories and essays. Prerequisite: Junior standing or consent of the instructor.
220. **German Culture and Civilization.** 4 hours. Survey of the development of German culture from earliest times to the present: art, architecture, music, society. Lectures, selected readings, and slides. Prerequisite: Ger. 106 or the equivalent. W
221. **Introduction to German Literature.** 4 hours. A linguistic and literary introduction to the various genres. Prerequisite: Ger. 106 or the equivalent. S, F
230. **Contrastive Applied Linguistics.** 3 hours. German phonology, morphology, syntax, and semantics in comparison with English. Prerequisite: Ger. 202 or the equivalent. S
240. **The Teaching of German in the Secondary School and College.** 4 hours. Modern techniques, including the use of the language laboratory, in the teaching of German. Prerequisite: Ger. 230. F
250. **Reading German I.** 4 hours. An accelerated course for beginners; designed to prepare students for reading examinations in German. Primarily for upper division and graduate students in other departments. Reading of specialized texts in the humanities, social sciences, and natural sciences. Does not meet graduation requirements in foreign language.
251. **Reading German II.** 4 hours. Continues German 250. Prerequisite: Ger. 250 or the equivalent.

290. **Masterworks of German Literature I.** 4 hours. The classical period. Prerequisite: Ger. 221 or the equivalent. W
292. **Masterworks of German Literature II.** 4 hours. Romanticism and poetic realism. Prerequisite: Ger. 221 or the equivalent. S
294. **Masterworks of German Literature III.** 4 hours. From Naturalism to the present. Prerequisite: Ger. 221 or the equivalent. F
298. **Honors Thesis.** 4 hours. Restricted to German majors in their last year of work toward completion of the major. May not be taken in the last quarter in which student expects to graduate. Prerequisites: Ger. 290, 292, 294 or the equivalent, and at least a 4.6 average in all German courses previously taken. S
299. **Independent Study.** 1 to 3 hours. May be repeated for credit. Open only to German majors and minors who are working on special projects. Prerequisites: Ger. 106 or the equivalent and approval of the department. W, S, Su, F
320. **Writing and Speaking German V.** 3 hours. Prerequisite: Ger. 204 or the equivalent.
321. **Writing and Speaking German VI.** 3 hours. Prerequisite: Ger. 320 or the equivalent.
370. **The German *Novelle*.** 4 hours. Reading and interpretation of representative *Novellen* of the nineteenth and twentieth centuries. Prerequisites: Ger. 221 and two additional German literature courses or consent of the instructor. F
372. **German Drama.** 4 hours. Development from the Enlightenment to the present. Prerequisites: Ger. 221, and two additional German literature courses or consent of the instructor. W
374. **Poetry from the Seventeenth Century to the Present.** 4 hours. Prerequisites: Ger. 221 and two additional German literature courses or consent of the instructor. S
380. **Goethe's *Faust*.** 4 hours. Intensive study of Parts I and II. Prerequisites: Ger. 221 and two additional German literature courses or consent of the instructor. S
382. **German Literature to 1750.** 4 hours. Prerequisites: Ger. 221 and two additional German literature courses or consent of the instructor. F
385. **Germanic Linguistics.** 4 hours. Linguistic geography, "Sprachschichten", and principles of structural linguistics. Prerequisite: Ger. 203 or the equivalent. F
390. **Topics in German Literature.** 4 hours. May be taken more than once for credit. Reading and discussion of the work of one prominent German author or of a group of related authors. Subject varies and is chosen by the instructor. Prerequisites: Ger. 290, 292, 294, or consent of the instructor. W, Su

GREEK (Gr)

100. **Classical Greek. 4 hours.** Not open to majors in Greek. Intensive introductory course. Rapid introduction to the language of Homer and Plato. Designed for students who wish sufficient training to begin reading on their own.
101. **Elementary Greek I. 4 hours.** The fundamentals of ancient classical Greek, including the reading of simple prose. Eligibility will be tested during the first meeting.
102. **Elementary Greek II. 4 hours.** Continues Greek 101. Grammar and reading. Prerequisite: Gr. 101 or the equivalent. W
103. **Elementary Greek III. 4 hours.** Continues Greek 102. Prerequisite: Gr. 102 or the equivalent. S
104. **Intermediate Greek I. 4 hours.** Introduction to epic poetry. Selections from Homer. Prerequisite: Gr. 103 or the equivalent. F
105. **Intermediate Greek II. 4 hours.** Introduction to dramatic poetry. Prerequisite: Gr. 104 or the equivalent. W
106. **Intermediate Greek III. 4 hours.** Introduction to philosophic prose: Study of Plato's *Socratic Dialogues*. Prerequisite: Gr. 105 or the equivalent. S
201. **Xenophon: *Hellenica*, Books I and II. 4 hours.** Reading and translation. Prerequisite: Gr. 106 or the equivalent.
202. **Plato: *Socratic Dialogues*. 4 hours.** Reading and translation of at least two of the following: *Apology*, *Crito*, *Charmides*, *Laches*, *Euthyphro*, *Hippias Minor*, *Ion*. Prerequisite: Gr. 106 or the equivalent.
203. **Attic Orators. 4 hours.** Reading and translation of selected orations by one or more of the Attic orators. Prerequisite: Gr. 106 or the equivalent.
205. **Homer: *Odyssey*. 4 hours.** Reading and translation of selections. Prerequisite: Gr. 106 or the equivalent.
210. **Greek Lyric Poetry. 4 hours.** Reading and translation of selections from the lyric poets. Prerequisite: Gr. 106 or the equivalent.
211. **Prose Composition. 4 hours.** Extensive practice in translation from English to Greek; review of grammar and forms. Prerequisite: Gr. 106 or the equivalent.
215. **Aeschylus: Tragedies. 4 hours.** Reading and translation of one or more of the tragedies of Aeschylus. Prerequisite: Gr. 106.
220. **Sophocles: Tragedies. 4 hours.** Reading and translation of one or more of the tragedies of Sophocles. Prerequisite: Gr. 106 or the equivalent.

225. **Euripides: Tragedies.** 4 hours. Reading and translation of one or more of the tragedies of Euripides. Prerequisite: Gr. 106 or the equivalent.
275. **Herodotus. Histories.** 4 hours. Reading and translation of portions of several of the books. Prerequisite: Gr. 106.
299. **Independent Reading.** 4 hours. Individual study under faculty direction. For students qualified by preparation and interest. Prerequisite: Gr. 201 or the equivalent. W, S, F

HEALTH SCIENCE (HSci)

180. **Personal and Community Health.** 3 hours. Fundamentals of medical science; dynamics of health in the individual, the family, and the community. Scientific prevention of illness; health protection; principles of treatment of common medical problems.
240. **Mental Health in the Modern Urban Community: Problems and Prospects.** 3 hours. Definition of urban problems and their impact upon the mental health of the individual, the family, and the community. Health, education, housing, ethnic, racial, employment, criminal, and other factors—their impact on individuals and families. Evaluation of programs for prevention and processes of treatment from the viewpoint of the individual and the community. Prerequisite: Sophomore standing. HSci. 180 is recommended.

HEBRAIC STUDIES (Heb)

These courses have been approved by the College of Liberal Arts and Sciences and are taken on the campus of the College of Jewish Studies. Registration in these courses does not involve concurrent enrollment.

101. **Elementary Hebrew.** 4 hours. For students who have not studied Hebrew. Grammar, pronunciation, reading, composition, and conversation.
102. **Elementary Hebrew.** 4 hours. Continues Hebrew 101. Prerequisite: Heb. 101 or the equivalent.
103. **Elementary Hebrew.** 4 hours. Continues Hebrew 102. Prerequisite: Heb. 102.
104. **Intermediate Hebrew.** 4 hours. Rapid reading of modern authors and Israeli newspapers. Syntax and composition; conversational practice. Prerequisite: Heb. 103 or the equivalent.
105. **Intermediate Hebrew.** 4 hours. Continues Hebrew 104. Prerequisite: Heb. 104 or the equivalent.
106. **Intermediate Hebrew.** 4 hours. Continues Hebrew 105. Prerequisite: Heb. 105 or the equivalent.

HISTORY (Hist)

- 101. **Introduction to Ancient History. 4 hours.** Introduction to history and historical methods through the study of ancient Near Eastern, Greek, and Roman history. Particular attention to the use of primary sources in reconstructing the past.
- 111. **Introduction to Western European History. 4 hours.** Introduction to history and historical methods through the study of aspects of Western European history from the Middle Ages to the present. Particular attention to the use of primary sources in reconstructing the past.
- 121. **Introduction to British History. 4 hours.** Survey of certain aspects of British civilization in their historical setting.
- 131. **Introduction to Eastern European History. 4 hours.** Introduction to history and historical methods through the study of Russian, Balkan, and East Central European history. Particular attention to the use of primary sources in reconstructing the past.
- 141. **Introduction to African History. 4 hours.** Introduction to history and historical methods through the study of African history. Particular attention to the use of primary sources in reconstructing the past.
- 151. **Introduction to American History. 4 hours.** Introduction to history and historical methods through the study of American history. Particular attention to the use of primary sources in reconstructing the past.
- 161. **Introduction to Latin-American History. 4 hours.** Survey of certain aspects of Latin-American civilization in their historical setting.

Note: 200-level and 300-level courses are restricted to juniors, seniors, and those lower-division students who have the consent of the instructor.

- 201. **The Ancient World: Prehistory and the Ancient Near East. 4 hours.** Individual conferences on assigned papers are required. The evolution of civilization. Ancient civilization prior to the Greeks. Prerequisite: 4 hours of history at the 100 level, or junior standing or approval of the department.
- 202. **The Ancient World: Greece to the Age of Alexander. 4 hours.** Individual conferences on assigned papers are required. Development of Greek civilization from the Helladic to Hellenistic periods. Prerequisite: 4 hours of history at the 100 level, or junior standing or approval of the department.
- 203. **The Ancient World: Rome. 4 hours.** Individual conferences on assigned papers are required. Development of Roman civilization from the eighth century B.C. to the fall of the Roman Empire. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
- 206. **The Middle Ages from 400 to 814. 4 hours.** Europe from the time of the barbarian invasion to the death of Charlemagne. Prerequisite: 4 hours of history of the 100 level or junior standing or approval of the department.

207. **The Middle Ages from 814 to 1250. 4 hours.** Europe from the death of Frederick II. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
208. **The Middle Ages from 1250 to 1500. 4 hours.** Europe from the rise of the towns to the establishment of national monarchy. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
211. **Europe: 1500 to 1618. 4 hours.** Individual conferences on assigned papers are required. From the Renaissance to the outbreak of the Thirty Years' War. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
212. **Europe: 1618 to 1713. 4 hours.** Individual conferences on assigned papers are required. From the Thirty Years' War to the Peace of Utrecht. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
213. **Europe: 1713 to 1815. 4 hours.** Individual conferences on assigned papers are required. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
214. **Europe: 1815 to 1870. 4 hours.** Individual conferences on assigned papers are required. From the Congress of Vienna to the Franco-Prussian War. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
215. **Europe: 1870 to 1919. 4 hours.** Individual conferences on assigned papers are required. From the Franco-Prussian War to World War I. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
216. **Europe: 1919 to the Present. 4 hours.** Individual conferences on assigned papers are required. Europe since World War I. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
218. **German History from 1618 to 1740. 4 hours.** The Thirty Years' War: its political, economic, and social effects on German public life. The rise of absolutism, the decline of the *Reich*, economic reconstruction and cameralism, the changing structure of social relationships. Prerequisite: 4 hours of history at the 100 level, or junior standing or approval of the department.
219. **German History from 1740 to 1848. 4 hours.** The rise of Prussia and Austro-Prussian dualism; enlightened absolutism in Germany in the revolutionary period; the rise of political ideologies and middle-class culture; the revolutions of 1848. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
220. **Modern Germany from 1848 to the Present. 4 hours.** Germany's political, economic, and social reaction to the problems of national unification, industrialism, liberalism, world-power status, and rejuvenation after the loss of that status in the two World Wars. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

221. **History of England to 1485. 4 hours.** Individual conferences on assigned papers are required. Survey from the Celtic immigration to the accession of Henry VII. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
222. **History of England from 1485 to 1714. 4 hours.** Individual conferences on assigned papers are required. England during the reigns of the Tudors and the Stuarts. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
223. **History of England from 1714 to the Present. 4 hours.** Individual conferences on assigned papers are required. From the accession of the Hanoverians to the present. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
225. **Development of Modern France from 1815 to 1914. 4 hours.** Investigation into the major political and socioeconomic forces at work in French history from the fall of Napoleon to World War I. The uniqueness and the universality of the French experience are stressed. Prerequisite: 4 hours of history at the 100 level, or junior standing or approval of the department.
226. **Development of Modern France from 1914 to the Present. 4 hours.** Investigation into the major political and socioeconomic forces at work in French history from World War I to Charles de Gaulle's Fifth Republic. The uniqueness and the universality of the French experience are stressed. Prerequisite: 4 hours of history at the 100 level, or junior standing or approval of the department.
229. **Italian History from 1815 to 1870. 4 hours.** The impact of the French Revolution, the *Risorgimento*, the creation of the Italian nation-state, and the early years of the Kingdom of Italy. Prerequisite: 4 hours of history at the 100 level, or junior standing or approval of the department.
230. **Italian History from 1870 to the Present. 4 hours.** Development of the Italian national state: political, social, and economic problems before World War I, the church-state relationship, colonial ambitions, the fascist corporate state, the Italian Republic since World War II. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
231. **History of Byzantine Civilization from 330 to 1054. 4 hours.** The cultural, religious, and social history of the Eastern Roman Empire from the founding of Constantinople to 1054. Special attention to the continuation of classic ideals and Byzantine relations with the Latin West and the Slavic, especially the Russian, worlds. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
232. **History of the Byzantine Civilization from 1054 to 1453. 4 hours.** The cultural, religious, and social history of the Eastern Roman Empire from 1054 to the fall of Byzantium. Special attention to the continuation of classical ideals and Byzantine relations with the Latin West and the Slavic, especially the Russian, worlds. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

233. **History of East-Central Europe since 1526. 4 hours.** The political, social, economic, and cultural development of Austria, Hungary, Poland, and the Czechoslovak lands from the Battle of Mohacs to the present. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
235. **Russia from the Earliest Times to Peter the Great. 4 hours.** Individual conferences on assigned papers are required. The Russian people, state, and culture from their origins to the death of Peter the Great in 1725. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
236. **Imperial Russia. 4 hours.** Individual conferences on assigned papers are required. Political, diplomatic, intellectual, and social developments in the Russian Empire from the death of Peter the Great to the Revolution of 1905. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
237. **The Russian Revolution and the Soviet Union. 4 hours.** Individual conferences on assigned papers are required. Russian and Soviet political, diplomatic, ideological, economic, social, and cultural developments during the Duma period, World War I, the Russian Revolution and war, communism, the NEP, and the Five Year Plan. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
241. **History of Western Africa and the Sudan. 4 hours.** Development of native African states from earliest times; the impact of European and other alien influences on the continent; emergence of the modern independent African states. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
243. **Eastern Africa and the Horn. 4 hours.** Development of native African states from earliest times; the impact of European and other alien influences on the continent; emergence of the modern independent African states. Prerequisites: 4 hours of history at the 100 level or junior standing or approval of the department.
245. **Southern Africa and the Congo. 4 hours.** Development of native African states from earliest times; the impact of European and other alien influences on the continent; emergence of the modern independent African states. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
251. **History of the United States to 1816. 4 hours.** Individual conferences on assigned papers are required. From colony to nationhood: European foundations, colonial development, independence, and early nationhood. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
252. **History of the United States from 1816 to 1898. 4 hours.** Individual conferences on assigned papers are required. America in the nineteenth century: Jacksonian democracy, changing issues and parties, sectionalism, the Civil War and Reconstruction, the consequences of the industrial revolution. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
253. **History of the United States since 1898. 4 hours.** Individual conferences on assigned papers are required. The emergence of the United States as a world

power. World Wars I and II, problems of economic and social change in modern times, the cold war. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.

257. **Afro-American History to the Seventeenth Century.** 4 hours. Individual conferences on assigned papers are required. West African origins of the American black population, the slave trade and seventeenth century slavery. Prerequisite: 4 hours of history at the 100 level, or junior standing or approval of the department.
258. **Afro-American History from the Eighteenth Century to the Civil War.** 4 hours. Individual conferences on assigned papers are required. Afro-American slavery, black religion, black leadership, the black role in antislavery movements, the plantation and its way of life. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
259. **Afro-American History since the Civil War.** 4 hours. Individual conferences on assigned papers are required. The Reconstruction, black institutions and organizations, black labor, varieties of civil rights approaches and leaders thereof. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
261. **Colonial Latin America.** 4 hours. Individual conferences on assigned papers are required. Iberian discovery, conquest, and settlement of America; the establishment of Spanish and Portuguese institutions; social, economic, political, and cultural development in colonial societies from conquest to independence. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
262. **Latin America in the Nineteenth Century.** 4 hours. Individual conferences on assigned papers are required. The independence of Latin America and the establishment of the new nations. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
263. **Modern Latin America.** 4 hours. Individual conferences on assigned papers are required. The Latin American nations in the twentieth century; their social, economic, political, and cultural development, and their struggles for modernization. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
264. **Colonial Mexico.** 4 hours. The Indian background of Mexico, the Spanish conquest, the amalgamation of Spanish and indigenous cultures, and the evolution of Mexican economic, religious, social, and political institutions under Spanish domination until 1821. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
265. **The Mexican Nation from 1821 to 1910.** 4 hours. Social, economic, political, and cultural development from independence to the fall of Porfirio Diaz. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

266. **Mexico since 1910. 4 hours.** The Mexican Revolution and the development of the modern nation. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
267. **The Portuguese Empire in Brazil. 4 hours.** Portuguese discovery, settlement, and exploitation of Brazil during three centuries; creation of the Brazilian nation through an amalgamation of races and cultures in a plantation and mining economy. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
268. **Monarchy in Brazil from 1808 to 1889. 4 hours.** The foundation of Brazilian independence; consolidation of the nation; economic, social, political, and intellectual development. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
269. **Modern Brazil from 1889 to the Present. 4 hours.** The Conservative republic, the revolution of 1930, the Vargas era, economic, social, and cultural development, and the struggle for modernization. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
271. **History of China and Japan I. 4 hours.** Individual conferences on assigned papers are required. Survey of East Asian culture and the historical development of economic, social, and political systems in China and Japan from earliest times to 1200 A.D. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
272. **History of China and Japan II. 4 hours.** Individual conferences on assigned papers are required. Continues History 271. From 1200 to 1850. Prerequisite: Hist. 271.
273. **History of China and Japan III. 4 hours.** Individual conferences on assigned papers are required. Continues History 272. From 1850 to the present. Prerequisite: Hist. 272.
280. **Monuments and Institutions of Athens. 4 hours.** Individual conferences on assigned papers are required. Same as Classics 280. The monuments of Athens as they relate to the political and social institutions of the fifth century B.C. Prerequisite: Junior or senior standing.
286. **History of Minorities in the United States: Colonial Period through Reconstruction. 4 hours.** Individual conferences on assigned papers are required. Racial, ethnic, religious, and political minorities in the United States. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
287. **History of Minorities in the United States: Reconstruction to the Present. 4 hours.** Individual conferences on assigned papers are required. Racial, ethnic, religious, and political minorities in the United States. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
294. **History of Education in Western Civilization. 4 hours.** Individual conferences on assigned papers are required. History of education from antiquity to the present

in relation to social, political, and religious influences; development of education and educational institutions in the context of factors in European history which affected conceptions of learning and teaching; tensions between different ideals of learning and their influence on schools and curricula. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.

295. **The Teaching of History and Related Disciplines.** 4 hours. Introduction to source material and historical literature relevant to the teaching of history and related disciplines in the secondary school; exploration of basic concepts and major themes of historical interpretation. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
296. **History of Science.** 4 hours. Individual conferences on assigned papers are required. Development of science from its Greek origins to the present in terms of central ideas, such as atomism, evolution, and the relevance of mathematics to physics. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.
297. **History of Technology.** 4 hours. Individual conferences on assigned papers are required. The development of technology. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.
299. **Individual Study: Special Topics.** 2 to 5 hours. May be taken only once for 2 to 5 hours of general education credit, but may be repeated for credit for a maximum of 18 hours. However, without the specific consent of the department, no more than 5 hours in the same quarter may be taken under the direction of the same instructor, and no more than a total of 12 hours may be taken in the same quarter. Selected topics in history for individual study. Prerequisite: Consent of the instructor.
302. **Topics in Greek History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of ancient history or consent of the instructor.
303. **Topics in Roman History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of ancient history or consent of the instructor.
306. **Topics in Medieval History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of medieval history or consent of the instructor.
309. **Topics in the Renaissance.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
311. **Topics in Sixteenth Century European History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

312. **Topics in Seventeenth Century European History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
313. **Topics in Eighteenth Century European History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
314. **Topics in Nineteenth Century European History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
316. **Topics in Twentieth Century European History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
318. **Topics in German History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history.
321. **Topics in British History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
324. **Topics in French History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
329. **Topics in Italian History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
333. **Topics in Eastern European History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
335. **Topics in Russian History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.
341. **Topics in African History.** 4 hours. Individual conferences on assigned papers are required. Study in depth of specific problems of internal African history, with concentration on such topics as the African role in the slave trade, the growth and decline of African states, African syntheses with European culture, or the African reaction to European domination and conquest. Prerequisite: 4 hours of African history.

351. **Topics in Colonial American History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.
352. **Topics in Revolutionary and Early National United States History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.
353. **Topics in Nineteenth Century United States History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.
354. **Topics in Twentieth Century United States History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.
386. **Topics in Race, Ethnic, and Minority History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
388. **Topics in Economic History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
389. **Topics in Urban History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
390. **Topics in Diplomatic History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
391. **Topics in Constitutional History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
392. **Topics in Intellectual History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
393. **Topics in Historiography.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
395. **Topics in Religious History.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history.

396. **Topics in the History of Science.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.
397. **Topics in the History of Technology.** 4 hours. May be repeated for credit. Individual conferences on assigned papers are required. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

HISTORY OF ARCHITECTURE AND ART (HAA)

115. **Introduction to Art History.** 4 hours. Individual conferences on assigned papers are required. Introduction to the hypotheses of art. Visual and stylistic analysis; study of iconology; sociology of art; economics of art; criticism; the artist's role in history.
142. **History of Architecture and Art I.** 4 hours. Individual conferences on assigned papers are required. Form and meaning in architecture, sculpture, painting, and the allied arts from antiquity through the middle ages.
143. **History of Architecture and Art II.** 4 hours. Individual conferences on assigned papers are required. Form and meaning in architecture, sculpture, painting, and the allied arts from the early Renaissance through the late Baroque period. Prerequisite: HAA 115 or 142.
144. **History of Architecture and Art III.** 4 hours. Individual conferences on assigned papers are required. Form and meaning in architecture, sculpture, painting, and the allied arts from neoclassicism into the present. Prerequisite: HAA 115 or 143.
201. **Prehistoric Art.** 4 hours. Individual conferences on assigned papers are required. The art and artifacts of the Paleolithic and Neolithic peoples of Europe and Asia. Prerequisite: HAA 115 or 142 or consent of the instructor.
202. **Primitive Art.** 4 hours. Individual conferences on assigned papers are required. Survey of the arts of the primitive people of Africa, Oceania, and the Americas. Prerequisite: HAA 115 or 144 or consent of the instructor.
211. **Art and Archaeology of the Ancient Near East.** 4 hours. Individual conferences on assigned papers are required. The development of painting, sculpture, and allied arts in Egypt, western Asia, and the Aegean from the beginning of the Bronze Age to the end of the second millenium B.C. Prerequisite: HAA 115 or 142 or consent of the instructor.
212. **Greek Art and Archaeology.** 4 hours. Individual conferences on assigned papers are required. The development of painting, sculpture, and the allied arts of Greece from the end of the Bronze Age through the Hellenistic period. Prerequisite: HAA 115 or 142 or consent of the instructor.
213. **Roman Art and Archaeology.** 4 hours. Individual conferences on assigned papers are required. Painting, sculpture, and the allied arts of ancient Italy; special

emphasis on the development of Roman civilization. Prerequisite: HAA 115 or consent of the instructor.

221. **Early Christian and Byzantine Art. 4 hours.** Individual conferences on assigned papers are required. The art and architecture of the Latin West and the Greek East from the Age of Constantine through the First Golden Age of Byzantine art under Justinian. Prerequisite: HAA 115 or 142 or consent of the instructor.
222. **Early Medieval Art. 4 hours.** Individual conferences on assigned papers are required. The art and architecture of western Europe from the Dark Ages through the early Romanesque; special attention to the Carolingian and Ottonian revivals of antiquity. Prerequisite: HAA 115 or 142 or consent of the instructor.
223. **Medieval Art, 110 to 1400. 4 hours.** Individual conferences on assigned papers are required. Art and architecture of the mature Romanesque through the High Gothic age. Prerequisite: HAA 115 or 142 or consent of the instructor.
231. **Ancient Architecture. 4 hours.** Individual conferences on assigned papers are required. The development of the architecture of the ancient Near East, Greece, and Rome. Prerequisite: HAA 115 or 142 or consent of the instructor.
232. **Medieval Architecture. 4 hours.** Individual conferences on assigned papers are required. The development of early Christian, Byzantine, Romanesque, and Gothic architecture. Prerequisite: HAA 115 or 144 or consent of the instructor.
233. **Renaissance and Baroque Architecture. 4 hours.** Individual conferences on assigned papers are required. The development of European architecture from 1400 to 1750. Prerequisite: HAA 115 or 144 or consent of the instructor.
234. **American Architecture. 4 hours.** Individual conferences on assigned papers are required. The development of architecture in colonial America and the United States from 1600 to 1900. Prerequisite: HAA 115 or 144 or consent of the instructor.
235. **European Architecture, 1750 to 1900. 4 hours.** Individual conferences on assigned papers are required. Romantic Classicism and Gothic Revival in England, France, and Germany. Other revival styles and Art Nouveau. Building in iron and concrete. Prerequisite: HAA 115 or 144 or consent of the instructor.
236. **Twentieth Century Architecture. 4 hours.** Individual conferences on assigned papers are required. The development of architecture in Europe and the United States from 1900 to the present. Prerequisite: HAA 115 or 144 or consent of the instructor.
237. **Japanese Architecture. 4 hours.** Individual conferences on assigned papers are required. Religious, domestic, and landscape architecture of Japan. Prerequisite: HAA 115 or 144 or consent of the instructor.
238. **Pre-Columbian Architecture. 4 hours.** Individual conferences on assigned papers are required. Architecture of North, Central, and South America before 1500. Prerequisite: HAA 115 or 144 or consent of the instructor.

241. **Art of the Renaissance in Italy.** 4 hours. Individual conferences on assigned papers are required. Painting, sculpture, and architecture of the fifteenth and sixteenth centuries. Prerequisite: HAA 115 or 143 or consent of the instructor.
242. **Art of the Renaissance in Northern Europe.** 4 hours. Individual conferences on assigned papers are required. The art of the Lowlands, France, Germany, and England; emphasis on illuminated manuscripts, panel painting, and the work of Van Eyck, Van der Weyden, Bosch, Lochner, Durer, and the School of Fontainebleau. Prerequisite: HAA 115 or 143 or consent of the instructor.
251. **Art of the Baroque.** 4 hours. Individual conferences on assigned papers are required. Painting, sculpture, and the allied arts from the seventeenth through the mid-eighteenth centuries; emphasis on the work of Bernini, Rubens, Rembrandt, and Velasquez. Prerequisite: HAA 115 or 144 or consent of the instructor.
261. **Art of the Nineteenth Century.** 4 hours. Individual conferences on assigned papers are required. Painting, sculpture, and the allied arts in western Europe and the United States. Prerequisite: HAA 115 or 144 or consent of the instructor.
262. **Art of the Twentieth Century.** 4 hours. Individual conferences on assigned papers are required. Painting, sculpture, and the allied arts in western Europe and the United States. Prerequisite: HAA 115 or 133 or consent of the instructor.
271. **Art of China.** 4 hours. Individual conferences on assigned papers are required. Survey of Chinese painting, sculpture, and related arts from Neolithic times to the eighteenth century. Prerequisite: HAA 115 or 144 or consent of the instructor.
272. **Art of Japan.** 4 hours. Individual conferences on assigned papers are required. Survey of Japanese architecture, sculpture, painting, woodcuts, and related arts from prehistoric times to the nineteenth century. Prerequisite: HAA 115 or 144 or consent of the instructor.
273. **Art of India and Southeast Asia.** 4 hours. Individual conferences on assigned papers are required. Survey of architecture, sculpture, and painting from the Indus Valley civilization to the Mughal period. Prerequisite: HAA 115 or 144 or consent of the instructor.
280. **History of Industrial Design.** 4 hours. Individual conferences on assigned papers are required. Materials, techniques, and products from antiquity to the present; production methods; the role of the designer in industry and society. Prerequisite: 3 hours from HAA or consent of the instructor.
281. **Art in America to 1860.** 4 hours. Individual conferences on assigned papers are required. Painting, sculpture, and the significant handicrafts from Colonial America through the mid-nineteenth century United States. Emphasis on portraiture, historical painting, and the romantic landscape. Prerequisite: HAA 115 or 144 or consent of the instructor.
282. **Art in America from 1860 to 1945.** 4 hours. Individual conferences on assigned papers are required. Painting, sculpture, and the decorative arts from the mid-nineteenth century through World War II. The emergence of an American art

consciousness and progress toward international leadership. Prerequisite: HAA 115 or 144 or consent of the instructor.

284. **History of Photography. 4 hours.** Individual conferences on assigned papers are required. Technological and artistic development. Prerequisite: Sophomore standing or consent of the instructor.
285. **History of the Film I. 4 hours.** Individual conferences on assigned papers are required. From the beginnings in the 1890's to the establishment of the talking picture in the early 1930's. Prerequisite: Sophomore standing or consent of the instructor.
286. **History of the Film II. 4 hours.** Individual conferences on assigned papers are required. From the establishment of sound and the genres of the 1930's to the present. Prerequisite: Sophomore standing or consent of the instructor.
288. **The Intellectual Revolution of the Seventeenth and Eighteenth Centuries as Viewed through the Arts. 4 hours.** Same as Humanities 288 and Music 288. Evidence in the visual arts and music of the impact of the new cosmology on men's minds, imaginations, and emotions. Prerequisite: Sophomore standing.
291. **Art History Tutorial. 4 hours.** Individual conferences on assigned papers are required. The methodology and philosophies of art history. Application to selected problems in the field. Readings, discussions, and reports. Prerequisites: Junior standing and 12 hours of history of architecture and art at the 200 and 300 level.
331. **Seminar in Architectural History. 4 hours.** Individual conferences on assigned papers are required. Selected problems in the history of architecture. Prior to registration the student should be advised by the instructor. Prerequisite: 12 hours from HAA 231 through 238 or consent of the instructor.
332. **Readings in History of Architecture. 4 hours.** Individual conferences on assigned papers are required. Individually planned readings on selected topics under the supervision of a faculty member. Prior to registration the student should be advised by the instructor. Prerequisite: 12 hours from HAA 231 through 238.
333. **Literature, Theory, and Criticism. 4 hours.** Individual conferences on assigned papers are required. Selected readings and discussion of significant writers on architecture. Prior to registration the student should be advised by the instructor. Prerequisite: 12 hours from HAA 231 through 238.
334. **Chicago Building. 4 hours.** Individual conferences on assigned papers are required. Architectural and technical history of Chicago's commercial buildings from 1871 to the present. Prerequisite: 12 hours from HAA 231 through 238.
335. **Wright and His Contemporaries, 1890 to 1910. 4 hours.** Individual conferences on assigned papers are required. Frank Lloyd Wright's domestic buildings in the Chicago area and his relationship to other members of the Prairie School of midwest architecture. Lectures, discussions, and field trips. Prerequisite: 12 hours from HAA 231 through 238.

336. **Seminar: Adler and Sullivan.** 4 hours. Individual conferences on assigned papers are required. A critical study of Chicago's foremost architectural partnership: monuments, theories, and practice. Prerequisites: 12 hours from HAA 231 through 238 and HAA 334.
341. **Art of the Fifteenth Century in Florence.** 4 hours. Individual conferences on assigned papers are required. Stylistic and iconographic studies of works of the major painters, sculptors, and architects. Florentine history and literature will be considered in their relation to the visual arts. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.
342. **Art of the High Renaissance.** 4 hours. Individual conferences on assigned papers are required. Art of the great Italian centers during the late fifteenth and early sixteenth centuries. Emphasis on Leonardo, Raphael, Bramante, Bellini, Biondione, and Michelangelo. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.
343. **Italian Art from 1520 to 1600.** 4 hours. Individual conferences on assigned papers are required. Art of the sixteenth century; emphasis on painting and sculpture. Special attention is given to Corregio, Pontormo, Bronzino, Gianbologna, Michelangelo, Palladio, Titian, and Tintoretto. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.
361. **Proseminar in Modern Painting.** 4 hours. May be repeated for credit at the discretion of the department. Individual conferences on assigned papers are required. Selected examples; development and diffusion of style and iconography. Analogies in the history of ideas and events, technical change, and other pertinent material. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.
362. **Proseminar in Modern Sculpture.** 4 hours. May be repeated for credit at the discretion of the department. Individual conferences on assigned papers are required. Study of selected examples; development and diffusion of style and iconography. Analogies in the history of ideas and events, technical change, and other pertinent material. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.
363. **Contemporary Art.** 4 hours. Individual conferences on assigned papers are required. The most recent developments in contemporary art, its theories and production. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.
390. **Art History Tutorial.** 4 hours. Individual conferences on assigned papers are required. Methodology and philosophies of art history; applications to selected problems in the field. Readings, discussions, and reports concerning fundamental literature of art history. Prerequisites: Senior standing and 12 hours in history of architecture and art courses at the 200 and 300 levels or consent of the instructor.
391. **Special Studies in History of Art.** 4 hours. May be repeated for a maximum of 12 hours. Individual conferences on assigned papers are required. Discussions of special problems, with attention to a major theme, period, or artist. Student

reports are required. Prerequisites: Senior standing and 12 hours in history of architecture and art courses at the 200 and 300 levels or consent of the instructor.

392. **Readings in Art History.** 4 hours. May be repeated for credit at the discretion of the department. Individual conferences on assigned papers are required. Individually planned readings on selected topics under supervision of a faculty member. Prior to registration the student should be advised by the instructor. Prerequisites: Senior standing and 12 hours in history of architecture and art courses beyond the 100 level.

HUMANITIES (Hum)

101. **Introduction to Poetry.** 4 hours. Same as English 101. Reading and discussion of representative poems from the ancient world to the present. W, S, Su, F
102. **Introduction to Drama.** 4 hours. Same as English 102. Reading and discussion of representative plays from the ancient world to the present. W, S, Su, F
103. **Introduction to Fiction.** 4 hours. Same as English 103. Reading and discussion of representative fiction from the beginnings to the present. W, S, Su, F
104. **The Tradition of Western Literature of the Ancient World.** 4 hours. Same as Classics 104. Primarily for non-English and nonlanguage majors. Selected masterpieces of poetry, drama, and fiction of the ancient world. W, S, Su, F
105. **The Tradition of Western Literature from the Middle Ages through the Seventeenth Century.** 4 hours. Primarily for non-English and nonlanguage majors. Selected masterpieces of poetry, drama, fiction, and prose. W, S, Su, F
106. **The Tradition of Western Literature from the Eighteenth Century to the Present.** 4 hours. Primarily for non-English and nonlanguage majors. Selected masterpieces of poetry, drama, fiction, and prose. W, S, Su, F
107. **Colloquium on World Literature and Related Fields.** 4 hours. May be repeated for a maximum of 12 hours. One specific aspect of literature and its relationship to a limited problem in such fields as the fine arts, philosophy, politics, psychology, religion, science, and sociology. Emphasis on the close study of a limited number of works and on independent study, including oral and written reports.
108. **Colloquium on Themes in World Literature.** 4 hours. May be repeated for a maximum of 12 hours. One selected theme in world literature; emphasis on the close study of a limited number of works and on independent study, including oral and written reports.
170. **Masterpieces of Luso-Brazilian Literature in English Translation.** 3 hours. Same as Portuguese 170. Representative works in background material.
171. **Readings in Luso-Brazilian Culture.** 3 hours. Same as Portuguese 171. Selected topics. May be repeated for credit each quarter topics change.

185. **Masterpieces of German Literature in English Translation.** 4 hours. Same as German 185. Not open to German majors. Part of the French 185, German 185, Spanish 185 humanities sequence.
186. **Masterpieces of French Literature in English Translation.** 4 hours. Same as French 186. Not open to students majoring or minoring in French. Reading of selected works from the seventeenth century to the present day.
187. **Masterpieces of Spanish Literature in English Translation.** 4 hours. Same as Spanish 187. Not open to Spanish majors.
235. **Studies in Existentialist Literature.** 4 hours. Same as Philosophy 235. Imaginative works by Dostoevsky, Rilke, Kafka, Sartre, Jaspers, and Tillich. Prerequisite: Junior standing or consent of the instructor.
248. **Mythology of Greece and Rome.** 4 hours. Same as Classics 248. Mythology and religion, history, folk tales, and literature. Open to sophomores with permission of the department.
249. **Greek Tragic Drama in Translation.** 4 hours. Same as Classics 249. Knowledge of Greek is not required. The plays of Aeschylus, Sophocles, Euripides. Prerequisite: Junior standing or consent of the instructor.
251. **Greek Poetry in Translation.** 4 hours. Same as Classics 251. Knowledge of Greek is not required. Classical Greek poetry from its beginnings to the Byzantine period.
252. **Roman Satire.** 4 hours. Same as Classics 252. Knowledge of Latin is not required. Selections from Horace, Persius, Petronius, Seneca, Martial, and Juvenal.
253. **The Intellectual Development of Greece.** 4 hours. Same as Classics 253. Knowledge of Greek is not required. Selections from the philosophers, poets, historians, and scientists. Prerequisite: Junior or senior standing.
255. **Roman Comedy in Translation.** 4 hours. Same as Classics 255. Knowledge of Latin is not required. The plays of Plautus and Terence. Prerequisite: Junior standing or consent of the instructor.
256. **Greek and Roman Epic Poetry.** 4 hours. Same as Classics 256. Knowledge of Greek and Latin is not required. The epic poems of Homer, Lucretius, Vergil, and others in the Greco-Roman tradition. Prerequisite: Junior standing or consent of the instructor.
259. **Classical Literary Criticism.** 4 hours. Individual conferences on assigned papers are required. Same as Classics 259. Examination of the primary extant sources of literary criticism: Aristotle, *Poetica*; Horace, *Ars Poetica*; Pseudo-Longinus, *On the Sublime*; Quintilian, *Institutio Oratoria*. Knowledge of Greek or Latin is helpful but not essential. Prerequisite: Junior standing.
261. **French Civilization I.** 4 hours. Same as French 261. History of French civilization from the end of the Middle Ages to the end of the Wars of Religion, considered in

the light of changes which were typical for all of Western Europe. The literature, religious thought, art and science of this period are viewed against the background of political and social change. Prerequisite: Sophomore standing or consent of the instructor.

262. **French Civilization II. 4 hours.** Same as French 262. Social, political, and religious changes in the seventeenth and eighteenth centuries studied through the literature of the classical period and the French Enlightenment. Prerequisite: Hum. 261 or consent of the instructor.
263. **French Civilization III. 4 hours.** Same as French 263. The ideological struggles and social-political changes of the nineteenth and twentieth centuries in France as seen through the novels, memoirs, histories, and social tracts of the period. Prerequisite: Hum. 262 or consent of the instructor.
270. **Survey of Literature of the Western World from the Middle Ages Through the Renaissance. 4 hours.** Chronological survey of the major works of Western literature. Prerequisite: 8 hours in literature or consent of the instructor.
271. **Survey of Literature of the Western World from the Seventeenth Through the Eighteenth Centuries. 4 hours.** Chronological survey of the major works of Western literature. Prerequisite: 8 hours in literature or consent of the instructor.
272. **Survey of Literature of the Western World from the Nineteenth Century to the Present. 4 hours.** Chronological survey of the major works of Western literature. Prerequisite: 8 hours in literature or consent of the instructor.
273. **The Bible as Literature I: The Old Testament. 4 hours.** Same as English 273. Historical and analytical study of the Old Testament portion of the English Bible, concentrating on the King James Version and taking note of more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.
274. **The Bible as Literature II: The Apocrypha and the New Testament. 4 hours.** Same as English 274. Historical and analytical study of the Apocrypha and New Testament portions of the English Bible, concentrating on the King James Version and taking note of more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.
275. **Colloquium on Genres and Modes of World Literature. 4 hours.** May be repeated for a maximum of 12 hours. One particular genre or mode; emphasis on the close study of a limited number of works and on independent study, including oral and written reports. Prerequisite: 8 hours in literature or consent of the instructor.
276. **Colloquium on Movements and Influences on World Literature. 4 hours.** May be repeated for a maximum of 12 hours. One particular movement in or influence on world literature; emphasis on the close study of a limited number of works and on independent study, including oral and written reports. Prerequisite: 8 hours in literature or consent of the instructor.
277. **Colloquium on Ethnic and National Literature in Translation. 4 hours.** May be repeated for a maximum of 12 hours. One particular ethnic or national literature

in translation; emphasis on the close study of a limited number of works and on independent study, including oral and written reports. Prerequisite: 8 hours in literature or consent of the instructor.

287. **Forms of Modern Fiction.** 4 hours. Same as English 287. Major trends in the development of modern fiction from Flaubert to Faulkner. Prerequisite: Junior standing or consent of the instructor.
288. **The Intellectual Revolution of the Seventeenth and Eighteenth Centuries as Viewed through the Arts.** 4 hours. Same as History of Architecture and Art 288 and Music 288. Evidence in the visual arts and in music of the impact of the new cosmology on men's minds, imaginations, and emotions. Prerequisite: Sophomore standing.
289. **New Perceptions in Visual Arts, Music, and Science.** 4 hours. Same as Music 289. The extended sensory range of the twentieth century as represented in the visual arts, music, and science. Prerequisite: Sophomore standing.

INFORMATION ENGINEERING (Infe)

100. **General Biology.** 4 hours. Same as Biological Sciences 100. With Information Engineering 101 and 102, a three-quarter sequence which may be entered in any quarter. Audio-tutorial. Principles and fundamentals of biology through examination of diverse phenomena unique to biological systems. Lecture, laboratory, and discussion.
101. **General Biology.** 4 hours. Same as Biological Sciences 101. Continues Information Engineering 100.
102. **General Biology.** 4 hours. Same as Biological Sciences 102. Continues Information Engineering 101.
120. **Introduction to Electricity and Magnetism.** 4 hours. Essential elements of basic electricity and magnetism as summarized by Maxwell's equations in vector integral form. Prerequisite: Math. 133.
200. **Introduction to Bioengineering.** 4 hours. Fundamental aspects of some engineering problems presented by man, his society, his environment, and his interaction with machines. Topics indicate how engineering analysis may be applied to help solve some complex biological problems. Prerequisites: Math. 133 and Phys. 113, or the equivalents.
201. **History of Engineering.** 4 hours. Important elements in the growth of the art and science of engineering from ancient times to the present. Lives of some of the leaders. The effect of engineering on the social conditions of the various periods. Prerequisite: Junior standing or consent of the instructor.
210. **Introduction to Circuit Analysis.** 5 hours. Introductory treatment of electrical network theory; equilibrium equations, exponential signals and linear differential equations, initial conditions, forced responses, node and loop methods, network

theorems, power and energy. Laboratory experiments, including analog computer. Prerequisites: InfE. 120 or Phys. 113 and credit or registration in Math. 220.

212. **Signal Processing.** 4 hours. Exponential excitations and responses; signal representation in terms of Fourier series, Fourier transforms, bilateral and unilateral Laplace transforms; applications. Prerequisite: InfE. 210.
219. **Introduction to Electromagnetic Fields.** 4 hours. Elements of vector calculus; static electric and magnetic fields; elementary electromagnetic theory as summarized in Maxwell's equations in integral and differential form. Prerequisites: Phys. 113 or InfE. 120 and credit or registration in Math. 220.
221. **Introductory Electromagnetic Field Theory.** 3 hours. Maxwell's equations in integral and differential form; static electric and magnetic fields; wave motion and introduction to radiation. Prerequisite: InfE. 210 and 219.
240. **Introduction to Electronics.** 4 hours. Physical characteristics of high vacuum electron tubes, gaseous conduction and gas tubes, semiconductors, and transistors; tube and transistor characteristics and equivalent circuits; introduction to methods of analysis. Prerequisite: InfE. 210 or the equivalent.
259. **Neurobiology.** 3 hours. Same as Biological Sciences 259. Introduction to basic anatomical and physiological concepts of the human central nervous system. Prerequisite: One year of biological sciences or consent of the instructor.
280. **Vertebrate Morphogenesis.** 5 hours. Same as Biological Sciences 280. Introduction to vertebrate anatomy; emphasis on early embryology and histology. Lecture and laboratory. Prerequisite: One year of biological sciences.
281. **Structure and Development of Vertebrates I.** 5 hours. Same as Biological Sciences 281. With Information Engineering 282 a two-quarter sequence. Evolution of vertebrate organ systems; their embryogenesis and microscopic and gross anatomy. Lecture and laboratory. Prerequisite: InfE. 280.
282. **Structure and Development of Vertebrates II.** 5 hours. Same as Biological Sciences 282. Continues Information Engineering 281. Prerequisite: InfE. 281.
283. **General Genetics.** 5 hours. Same as Biological Sciences 240. Principles of heredity and variation illustrating the gene concept. Examples include animal, plant, microorganism, and human heredity. Lecture and laboratory. Prerequisite: One year of biological sciences. Math. 104, 105, 130, and organic chemistry are recommended.
284. **Cellular Biodynamics.** 5 hours. Same as Biological Sciences 261. The basic physiological activities common to cells; the functions characteristic of specialized cell types. Lecture and laboratory. Prerequisites: One year of biological sciences and Chem. 134 or 234.
292. **Undergraduate Research.** 2 to 4 hours. Research under the close supervision of a faculty member. Prerequisite: Consent of the instructor.

- 307. Cybernetics I. 4 hours.** Introduction to artificial intelligence and pattern recognition by computer. Programs for playing games, proving theorems, answering questions, and making medical diagnoses. Property selection and decision making techniques. Prerequisites: Math. 195 and either 250 or 370; or consent of the instructor.
- 311. Linear Systems Analysis. 4 hours.** Application of signal representations discussed in Information Engineering 212 to the analysis of linear systems; transform methods and frequency analysis; natural response, stability, signal flow graphs; Laplace transform with two variables; convolution integral and applications. Prerequisite: InfE. 212.
- 312. Introduction to Communication Engineering. 4 hours.** Introduction to communication systems; amplitude, frequency, and pulse-type modulation; correlation and correlation functions; noise and noise calculations; channel capacity and bandwidth-signal to noise ratio applications. Prerequisites: InfE. 311 and 340.
- 315. Intermediate Network Analysis. 4 hours.** Laplace transform analysis of networks; impedance and admittance function, network theorems; network functions; one and two port networks. Individual projects are required. Prerequisite: InfE. 311.
- 316. Introduction to Network Synthesis. 4 hours.** Continues Information Engineering 315. Covers positive real functions, L-C synthesis, RC, RL, and RLC synthesis, and filter design. Individual projects are required. Prerequisite: InfE. 315.
- 320. Introductory Wave Propagation and Transmission. 5 hours.** Transmission line theory and introduction to wave guides; elementary antenna theory. Prerequisite: InfE. 221.
- 324. Wave Propagation and Radiation I. 4 hours.** Maxwell's equations and electromagnetic waves. Analysis of wave propagation in rectangular and circular wave guides. Reduction of wave guide discontinuity problems to equivalent network problems. Prerequisites: InfE. 311 and 320.
- 325. Wave Propagation and Radiation II. 4 hours.** Antennas and radiating systems. Radiation from a quarter-wave monopole of half-wave dipole. Antenna impedance. Directional characteristics of antennas. Antenna practice and design. Prerequisite: InfE. 324.
- 326. Wave Propagation and Radiation III. 4 hours.** Motion of charged particles in fields. Principles of klystrons, magnetrons, and traveling wave tubes. Introduction to solid state parametric devices. Prerequisite: InfE. 325.
- 330. Communication Theory I. 4 hours.** With Information Engineering 331, an introduction to statistical communication theory. Signal spectra, modulation, noise, probability theory; applications of statistics to communications systems. Prerequisite: InfE. 312.
- 331. Communication Theory II. 4 hours.** Continues Information Engineering 330. Individual projects are required. Prerequisite: InfE. 330.

340. **Intermediate Electronics.** 4 hours. Continues Information Engineering 240. Applications of tubes, transistors, and semiconductor diodes; practical laboratory experience. Prerequisite: InfE. 240.
342. **Solid State Electronics.** 4 hours. Semiconductor physics and semiconductor circuits. Physics and circuit properties of transistors, semiconductor diodes, and other semiconductor devices; practical laboratory experience. Prerequisite: InfE. 340.
344. **Electronic Applications I.** 4 hours. With Information Engineering 345, a discussion of devices and circuits involved in pulse, digital, and switching wave forms. Prerequisite: InfE. 340.
345. **Electronic Applications II.** 4 hours. Continues Information Engineering 344. Prerequisites: InfE. 344 and credit or registration in InfE. 342.
347. **Thin Film Devices.** 4 hours. Introduction to vacuum technology. Methods of fabrication of films; sputtering, evaporation, electron beam evaporation, and chemical deposition. Physical properties of films. Application of such films as resistor, capacitor, transistor, diode, magnetic memory devices, and superconductors. Prerequisites: InfE. 342 and MatE. 230.
350. **Prostheses and Artificial Organs.** 4 hours. The special problems encountered in the design of organ replacements as engineering devices. Sub-organ replacements, circulatory assist devices, artificial kidneys and other organ systems. Prerequisites: InfE. 200, 383, 384, MatE. 230, and EnrE. 211 or the equivalents.
352. **Biocontrol.** 3 hours. Demonstration of the applicability of control systems theory to physiological systems, including the pupil system, eye and hand movement systems, and utilizing techniques such as Fourier analysis, Nyquist stability criteria, and cross-correlation. Prerequisites: InfE. 311 and 383 or 384 or consent of the instructor.
353. **Biocontrol Laboratory.** 3 hours. Experimental counterpart of Information Engineering 352. Motor coordination, crayfish photoreceptor, human pupil eye movement. Prerequisite: Credit or registration in InfE. 352.
354. **Bioinstrumentation: Transducers.** 4 hours. Consideration of energy conversion, with detailed discussion of transducers used in biological research. Prerequisites: InfE. 240 and 311.
360. **Automatic Control Theory I.** 4 hours. Introductory mathematical preliminaries of control systems. Concept of feedback; transfer functions of typical electrical, mechanical, and hydraulic control systems; state variable representation of systems; signal flow graphs; implications of feedback on system performance; time domain analysis; stability concepts including Lyapunov, Routh-Hurwitz, and Nyquist stability criteria. Laboratory assignments include experimental determination of the response of typical control systems and analog computer simulations. Prerequisite: InfE. 311 or SysE. 312.

- 361. Automatic Control Theory II.** 4 hours. Continues Information Engineering 360. Introduction to the design of feedback control systems. Frequency response methods, root locus, Nichols chart compensation techniques. Introduction to modern control theory, matrix representation of linear systems and mode interpretations, concepts of controllability and observability, and linear time-varying systems. Projects involving intensive studies on servo systems and extensive simulations on digital or analog computers. Prerequisite: InfE. 360.
- 371. Computer Structure and Language.** 4 hours. Computer structure and machine language, addressing techniques, components and circuits to execute the machine language instructions, digital representation of data, symbolic coding and programming techniques, computer system organization. Prerequisites: Math. 195, 340, and InfE. 340.
- 372. Discrete Mathematics in Computer Design.** 3 hours. Basic set algebra, algebraic structures, Boolean algebra and propositional logic and their applications to the design of switching circuits, graph theory, and applications. Prerequisite: InfE. 371.
- 373. Switching Theory and Applications.** 3 hours. Nondecimal number systems; error correcting and other codes, analysis of gating components and networks, truth tables, combinational networks, threshold logic, regular expressions, synthesis of sequential circuits, iterative and symmetric networks. Prerequisite: InfE. 372.
- 379. Real-Time Data Processing.** 4 hours. Theory and techniques of data processing using analog and digital computers. Emphasis on the unique computational problems presented by biological data, illustrating the practical use of communication theory. Prerequisites: Math. 195 and 220.
- 383. Animal Physiology I.** 5 hours. Same as Biological Sciences 363. The role of the digestive, circulatory, respiratory, and osmoexcretory systems in the maintenance of organismic homeostasis. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: InfE. 284.
- 384. Animal Physiology II.** 5 hours. Same as Biological Sciences 364. The role of the muscular, sensory, nervous, and endocrine systems in the maintenance of organismic integration. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: InfE. 284.
- 391. Seminar.** 1 to 4 hours. Topics to be arranged. Prerequisite: Senior standing or consent of the instructor.
- 393. Special Problems.** 2 to 4 hours. May be repeated for credit. Special problems or reading by arrangement with the faculty. Prerequisite: Senior standing or consent of the instructor.

ITALIAN (Ital)

- 101. Elementary Italian.** 4 hours. Two additional half hours per week in the language laboratory. For students without credit in Italian. Oral practice, reading, and grammar.

102. **Elementary Italian. 4 hours.** Two additional half hours per week in the language laboratory. Continues Italian 101. Prerequisite: Ital. 101 or the equivalent.
103. **Elementary Italian. 4 hours.** Two additional half hours per week in the language laboratory. Continues Italian 102. Prerequisite: Ital. 102 or the equivalent.
104. **Intermediate Italian. 4 hours.** Two additional half hours per week in the language laboratory. Rapid reading, grammar review, composition, conversation. Prerequisite: Ital. 103 or two years of high school Italian.
105. **Intermediate Italian. 4 hours.** Two additional half hours per week in the language laboratory. Continues Italian 104. Prerequisite: Ital. 104 or the equivalent.
106. **Intermediate Italian. 4 hours.** Two additional half hours per week in the language laboratory. Continues Italian 105. Prerequisite: Ital. 105 or the equivalent.
211. **Intermediate Composition and Conversation I. 3 hours.** Practice in oral and written expression based on the study of contemporary Italian material and appropriate grammar review. Prerequisite: Ital. 106 or the equivalent.
212. **Intermediate Composition and Conversation II. 3 hours.** Continues Italian 211. Prerequisite: Ital. 211.
213. **Intermediate Composition and Conversation III. 3 hours.** Continues Italian 212. Prerequisite: Ital. 212.
215. **Readings in Italian Literature. 3 hours.** Readings vary from quarter to quarter; course may be repeated for credit each quarter readings change. Introduction to the reading of literary Italian through representative examples of modern drama and fiction. Prerequisite: Ital. 106 or consent of the instructor.
220. **The Italian Novel of the Twentieth Century. 3 hours.** Main currents. Prerequisite: Ital. 106 or consent of the instructor.
221. **Italian Poetry of the Twentieth Century. 3 hours.** Development and nature of modern and contemporary Italian poetry. Prerequisite: Ital. 106 or consent of the instructor.
222. **Contemporary Italian Drama and Essay. 3 hours.** Development of Italian drama from Luigi Pirandello to the present. The twentieth century essay as a literary genre. Prerequisite: Ital. 106 or consent of the instructor.
299. **Independent Study. 1 to 6 hours.** Open only to qualified students majoring in a Romance language. Prerequisites: Proficiency in Italian and approval of the department.

LANGUAGE LABORATORY (LangL)

150. **For students taking any 101 foreign language course.** Intensive oral-aural practice. Two to six half hours per week.

151. For students taking any foreign language course beyond the 101 level which requires the use of the Language Laboratory. Intensive oral-aural practice. Two to six half hours per week.

LATIN (Lat)

101. **Elementary Latin I.** 4 hours. For students who have no credit in Latin. Grammar and reading. One additional half hour per week in the language laboratory. F
102. **Elementary Latin II.** 4 hours. Continues Latin 101. Grammar and reading of easy prose and poetry. One additional half hour per week in the language laboratory. Prerequisite: Lat. 101 or the equivalent. W
103. **Elementary Latin III.** 4 hours. Review of grammar; reading of prose. One additional half hour per week in the language laboratory. Prerequisite: Lat. 102 or two years of high school Latin. S
104. **Intermediate Latin I.** 4 hours. Selected readings in prose and poetry. Review of forms and grammar. One additional half hour per week in the language laboratory. Prerequisite: Lat. 103 or two years of high school Latin. F
105. **Intermediate Latin II.** 4 hours. Continues Latin 104. One additional half hour per week in the language laboratory. Prerequisite: Lat. 104 or the equivalent. W
106. **Intermediate Latin III.** 4 hours. Continues Latin 105. One additional half hour per week in the language laboratory. Placement by proficiency examination. Prerequisite: Lat. 105 or the equivalent. S
109. **Honors Course I.** 4 hours. *Note:* A student must have credit in Latin 110 and 111 to receive credit in 109. Rapid reading of Latin prose. Prerequisite: Three or four years of high school Latin with a B average or better or Lat. 106 or advanced placement by examination or consent of the instructor.
110. **Honors Course II.** 4 hours. *Note:* A student must have credit in Latin 109 and 111 to receive credit in 110. Rapid reading of Latin poetry. Prerequisite: Three or four years of high school Latin with a B average or better or Lat. 109 or advanced placement by examination or consent of the instructor.
111. **Honors Course III.** 4 hours. *Note:* A student must have credit in Latin 109 and 110 to receive credit in 111. Individual assignments at the discretion of the instructor. Rapid reading of Latin prose and poetry. Prerequisite: Three or four years of high school Latin with a B average or better or Lat. 110 or advanced placement by examination or consent of the instructor.
201. **Survey of Latin Literature I.** 4 hours. *Note:* A student must have credit in Latin 202 and 203 to receive credit in 201. Writings of the early period. Prerequisite: Lat. 106 or the equivalent.
202. **Survey of Latin Literature II.** 4 hours. *Note:* A student must have credit in Latin 201 and 203 to receive credit in 202. Writing of the middle period. Prerequisite: Lat. 201.

203. Survey of Latin Literature III. 4 hours. *Note:* A student must have credit in Latin 201 and 202 to receive credit in 203. Writings of the late period. Prerequisite: Lat. 202.
204. Catullus: *Carmina*. 4 hours. All the poems of Catullus, with special attention to the lyrics. Prerequisite: Lat. 106 or the equivalent. F
205. Pliny the Younger: *Epistulae*. 4 hours. Selections from the correspondence. Prerequisite: Lat. 106 or the equivalent. F
206. Cicero: *Philosophic Essays*. 4 hours. Selections from one or more of Cicero's philosophic writings—*De Amicitia*, *De Senectute*, *De Officiis*, *Tusculanae Quaestiones*. Prerequisite: Lat. 106 or the equivalent. W
207. Terence: *Fabulae*. 4 hours. Selections from two or more plays. Prerequisite: Lat. 106 or the equivalent. S
211. Prose Composition. 4 hours. Extensive translation from English to Latin; review of grammar and forms. Prerequisite: Lat. 106 or the equivalent.
250. Ovid: *Metamorphoses*, Selections. 4 hours. Reading and translation of selected books and myths from the *Metamorphoses*. Prerequisite: Lat. 106 or the equivalent. W
251. Juvenal: *Saturae*. 4 hours. Selections from the sixteen extant satires. Prerequisite: Lat. 106 or the equivalent.
252. Livy: *Ab urbe condita*, Selections. 4 hours. Reading and translation of selected books from Livy's *History of Rome*. Prerequisite: Lat. 106 or the equivalent. S
299. Independent Reading. 4 hours. Individual study under faculty direction. For students qualified by preparation and interest. Prerequisite: Lat. 201 or the equivalent. S
301. *Corpus Caesarianum*. 4 hours. For advanced undergraduates, graduates, secondary school teachers of Latin, and prospective teachers. Rapid reading of Latin prose, based on the *Corpus Caesarianum*; discussion of the linguistic, literary, social, and political aspects which contribute to the understanding of the texts read. Prerequisites: Junior or senior standing in Latin; at least one year of Latin beyond Lat. 106.
302. Vergil, I. *Aeneid*. 4 hours. The first course in a three-course sequence covering the major works. Prerequisite: Junior standing or consent of the instructor.
303. Vergil, II. *Aeneid*. 4 hours. Continues Latin 302. Prerequisite: Latin 302 or consent of the instructor.
304. Vergil, III. *Aeneid*. 4 hours. Continues Latin 303. Prerequisite: Lat. 303 or consent of the instructor.

310. **Plautus. *Comoediae*. 4 hours.** Selected comedies read in the original. Sources for the plays, their place in the history of Roman literature, and some examination of their influence on subsequent playwrights. Prerequisite: Senior standing in the discipline.
350. **Medieval Latin. 4 hours.** A literary and linguistic study of Latin texts originating between 350 and 1350 A.D. Prerequisites: Lat. 106 and 203 or the equivalents.
360. **Horace: *Odes and Epodes*. 4 hours.** The chief lyrical poems. Prerequisite: One 200-level course in Latin.
361. **Horace: *Saturae*. 4 hours.** The satirical poems. Prerequisites: Lat. 106 and 203 or the equivalents.
370. **Tacitus: Selections. 4 hours.** From the historical and biographical works. Prerequisite: One 200-level course in Latin.
381. **Roman Literary Criticism. 4 hours.** The principal contributions of Latin writers to the study of literature. Prerequisite: At least 12 hours credit in Latin at the 200-level or the equivalent.
382. **Roman Rhetoric. 4 hours.** Required for all Latin majors. The contributions of writers in Latin to the study and practice of rhetoric. Prerequisite: At least 12 hours credit in Latin or the equivalent.
390. **The Teaching of Latin in the Secondary School. 4 hours.** Theory and practice in foreign language instruction as they apply specifically to teaching Latin at the secondary level: objectives of instruction in Latin, historical perspectives, texts, and materials of instruction; preprofessional orientation. Prerequisite: At least 8 hours credit in Latin at the 300 level or approval of the department.

LINGUISTICS (Ling)

295. **Modern English Grammars. 4 hours.** Same as English 295. Introduction to the newer grammars of English, including the structural and transformational; some attention to their applications in the teaching of English. Prerequisite: Junior standing or consent of the instructor.
315. **Introduction to Linguistics. 4 hours.** Introduction to theories of the syntactic, morphological, and phonological analysis and description of language. Prerequisite: Senior standing, 12 hours in English, or consent of the instructor.
354. **The Psychology of Language. 4 hours.** Same as Psychology 354 and Speech and Theater 354. Introductory survey of methods, theory, and research; acquaints students with the history and present status of psychology's interest in language behavior. Prerequisite: Consent of the instructor.
380. **Problems in Linguistic Analysis. 4 hours.** Same as Anthropology 380. Examination of the methods and techniques used in linguistics, with reference to actual

language data; emphasis on anthropological applications. Prerequisite: Anth. 280 or Ling. 315 or consent of the instructor.

387. **The Structure of English. 4 hours.** Critical evaluation of traditional and structuralist grammatical descriptions; introduction to transformational grammatical studies; detailed survey of a transformational syntax of English; brief introduction to generative phonology and morphophonemic analysis of English, especially stress. Prerequisite: Engl. 301 or Ling. 315 or consent of the instructor.

LITERATURE IN TRANSLATION. See Humanities.

MANAGEMENT (Mgmt)

330. **Organizational Psychology. 4 hours.** Same as Psychology 330. Individual psychological and group processes and their interaction with organizational structure. Behavioral factors in effective organizational change. Prerequisites: Psch. 230 and one course in social psychology or the equivalents.
333. **Motivation and Morale in Industry. 4 hours.** Same as Psychology 333. Concepts and methods in the assessment and modification of employee motivation, attitudes, and morale. Prerequisite: 12 hours of psychology, including Psch. 332 or the equivalent.
335. **Psychology of Industrial Training. 4 hours.** Same as Psychology 335. Psychological measurement techniques in assessing training needs and evaluating training effectiveness. Application of psychological techniques to the development of industrial training programs. Prerequisite: Psch. 332 or the equivalent.
338. **Psychology of Industrial Conflict. 4 hours.** Same as Psychology 338. Behavioral analysis of the causes, dimensions, and modes of resolution of industrial conflict; special emphasis on labor-management relations. Prerequisite: Psch. 330 or the equivalent.
350. **Organization and Administration. 4 hours.** Theories of management; concepts of organization; major functions of management; fundamentals of decision making. Emphasis on the role of management and administration within the business firm. Prerequisite: QM 272.
351. **Organization Theory. 4 hours.** Important theories of organization: their foundation, application, and consequences in the attainment of individual and organization objectives. Emphasis on formal and informal aspects of organizations, authority relationships, and structural aspects. Prerequisite: Mgmt. 350.
352. **Administrative Practices. 4 hours.** Examination of executive and manager behavior in working organizations. Analysis of human problems and relationships at work. Leadership styles, problems of motivation and attitudes. Emphasis on behavioral science theory and technology as applied to business. Case method of analysis and study. Prerequisites: Mgmt. 351.

353. **Personnel Management.** 4 hours. The foundation, history, and objectives of manpower management; motivation and supervision; selection, training, and discipline; union-management relations; wage-and-salary administration; personnel research. Prerequisite: Mgmt. 350.
354. **Industrial Relations Systems.** 4 hours. Analysis of labor unions and their impact on business firms and society. Types of labor-management relationships and collective bargaining practices. Examination of public policy, union structure, and bargaining theory. Prerequisite: Mgmt. 353 or the equivalent.
356. **Operations and Systems Management II.** 4 hours. Application of managerial sciences to operations and control of operational systems. Emphasis on systems operations facilities, systems standards and information flow, system maintenance, and the behavioral interface and system control. Prerequisite: Mgmt. 355 or the equivalent.
357. **Operations and Systems Management III.** 4 hours. Emerging concepts in management science. Managerial applications of computer technology and utilization and related electronic data processing. Application of quantitative methods to information and control methods and systems. Process and systems design. Prerequisite: Mgmt. 356.
358. **Managerial Logistics.** 4 hours. The management of all activities governing the physical flow of raw materials and finished goods through stages of production on to points of final consumption. Key areas considered include design of logistics systems, location theory, inventory control, and the use of mathematical techniques in solving problems of logistics management. A logistics system computer simulation game is used. Prerequisites: Mgmt. 351 and Econ. 321.
359. **Business Policy.** 4 hours. A capstone course which provides an understanding of the direction of business operations from the top-management point of view rather than from the limited view of a particular functional-area specialist. By means of class discussion, written analysis of cases, and development of feasible plans of action, students gain experience in determining problem areas in company planning and management and in dealing successfully with a constantly changing business environment. Prerequisite: Completion of core requirements of the College of Business Administration.
360. **Business, Society, and Technology.** 4 hours. Business and the corporate role in a complex, technological society. Emphasis on the historical evolution of business; the many relationships of the corporation to its external environment; urban problems of business; the impact of the corporation on individual and group behavior. Prerequisites: Senior standing, Econ. 322 or 323, and Mgmt. 351.
363. **Collective Bargaining.** 4 hours. Intensive examination of the structure and conduct of collective bargaining; the determination of the bargaining unit and bargaining representative; the negotiation and scope of contracts; the administration of contracts; the major substantive issues in negotiations; the procedures for resolving industrial conflict. Prerequisites: Mgmt. 353 and 354.
399. **Independent Study.** 2 to 4 hours. May be repeated once for credit. Students in the College of Business Administration may register for this course to pursue

advanced independent study in approved topic(s) related to management. Written report prepared under the guidance of a major professor is required. Prerequisites: 16 hours of management courses at the 200 and 300 levels and consent of the department head.

MARKETING (Mktg)

- 360. **Principles of Marketing.** 4 hours. Required of all students in the College of Business Administration. The workings of the marketing system and the way in which marketing decisions are made.
- 361. **Consumer Market Behavior.** 4 hours. Motivations underlying market behavior of consumers, producers, middlemen; drives, emotions, desires, learning, memory; effects of demographic characteristics, social status, and reference groups on marketing action. Prerequisite: Mktg. 360 or consent of the instructor.
- 362. **Marketing Research.** 4 hours. Investigation of the gathering and interpretation of information used in solving marketing problems; pertinent modern research techniques from mathematics and the behavioral sciences are employed in developing an analytical structure. Prerequisites: Mktg. 361 and QM 172 or the equivalents.
- 363. **Marketing Organization.** 4 hours. Principles underlying the development of an integrated distribution system; its relationship to the marketing structure of the firm; evaluation of decisions on raw-material sources, plant and warehouse location, wholesale and retail outlets; analysis of the movement of products through marketing channels. Prerequisite: Mktg. 362 or consent of the instructor.
- 364. **Managing Marketing Communications.** 4 hours. Analysis of communication information among producers, middlemen, and consumers for marketing purposes; managerial problems in directing a firm's promotional efforts; personal selling, advertising, sales promotion, public relations. Prerequisite: Mktg. 363 or consent of the instructor.
- 365. **Marketing Management.** 4 hours. Seminar. Building marketing programs to implement the achievement of marketing objectives. Individual and group research and presentation from the viewpoint of major marketing executives of the firm; business case analysis. Prerequisite: Mktg. 364.

MATERIALS ENGINEERING (MatE)

- 101. **Engineering Mechanics I.** 3 hours. Statics of particles and rigid bodies. Kinematics and dynamics of particles. Work and energy, impulse and momentum. Principles of vibration analysis. Prerequisite: MatE. 111, Math. 132, or the equivalent.
- 102. **Engineering Mechanics II.** 3 hours. Kinematics and kinetics of rigid bodies, energy and momentum methods. Mechanical vibrations of rigid bodies. Prerequisite: MatE. 101.

103. **Engineering Mechanics III.** 3 hours. Analysis of stress and strain, principal stresses and strains. Constitutive laws of elastic and selected types of inelastic materials. Strain energy and failure criteria. Simple problems of stress and deformation analysis. Prerequisite: MatE. 111, Math. 133, or the equivalent.
111. **Engineering Statics.** 3 hours. Resultants of force systems, algebraic and graphical condition of equilibrium for force systems; moment diagrams, virtual work, forces due to friction; centroids. Prerequisite: Math. 130.
142. **Properties of Materials I.** 4 hours. Introduction to the atomic, molecular, crystalline, and microstructural nature of metals, ceramics, and plastics. Equilibrium phase relationships. Dependence of mechanical and physical properties on microstructure. Prerequisite: Math. 131, high school credit in chemistry, or the equivalent.
200. **Engineering Mechanics III.** 4 hours. Description of the mechanical behavior of deformable bodies. Concepts of stress and strain, principal stresses and strains, constitutive laws of elastic and selected types of inelastic materials, failure and design criteria. Simple problems of stress and deformation analysis. Prerequisites: MatE. 101 and Math. 133.
203. **Composition and Properties of Concrete.** 3 hours. Properties and functions of the constituents; physical and chemical structure and hydration; strength and deformation characteristics of hardened concrete; relations between microproperties and macroproperties. Prerequisites: MatE. 103 and 142.
204. **Mechanics of Solids I.** 4 hours. The basic relations governing the behavior of an elastic body and simple exact solutions. Engineering approximations: bending, torsion, buckling. Prerequisites: MatE. 103 and Math. 133.
205. **Mechanics of Solids II.** 4 hours. Structural energy principles: virtual work, potential energy, complementary energy, reciprocity. Application to beams, frames, trusses, and the like. Prerequisite: MatE. 204.
206. **Mechanics of Solids III.** 4 hours. The plane problem of elasticity and simple solutions in Cartesian and polar coordinates. Engineering approximations: thin-walled pressure vessels, torsion of thin-walled sections, beams on elastic foundations. Prerequisite: MatE. 204.
207. **Structural Analysis I.** 4 hours. Analysis of statically determinate problems. Application of energy methods to statically indeterminate problems. Beam-columns and beams on elastic foundation. Influence lines. Prerequisite: MatE. 205.
208. **Mechanical Vibrations.** 4 hours. Free and forced vibrations of damped and undamped linear single and multiple degree-of-freedom systems. Introduction to nonlinear system vibration. Approximate methods, instrumentation, and applications. Prerequisites: MatE. 102, Math. 220, or the equivalents.
209. **Analysis and Synthesis of Mechanisms.** 4 hours. Analytical and graphical analysis of plane and spatial motion. Geometrical and algebraic synthesis of mechanisms. Computer methods, applications. Prerequisite: MatE. 102.

221. **Behavior and Design of Metal Structures I.** 3 hours. Design of metal structures; behavior of members and their connections; theoretical, experimental, and practical bases for proportioning members. Prerequisite: MatE. 205.
225. **Design of Concrete Structures.** 4 hours. Analysis and design of concrete structural elements: beams, columns, slabs, and the like. Prestressed concrete design. Prerequisite: MatE. 203.
230. **Properties of Materials II.** 4 hours. Effects of deformation and thermal treatments upon microstructure and properties. Heat treatment of precipitation and transformation hardenable materials. Corrosion and surface reactions. Prerequisite: MatE. 142.
239. **X-Ray Metallography I.** 3 hours. Part I of a two-course sequence. X-ray generation and scattering. Applications of methods of X-ray diffraction to studies of crystallography and problems in physical metallurgy, such as phase identification, lattice parameter determination, grain size determination, preferred orientation, surface topography and residual stress determination. Prerequisite: MatE. 230.
241. **Experimental Methods in Solid and Fluid Mechanics.** 4 hours. Same as Energy Engineering 241. Introduction to the theory and practice of experimental methods, measurement techniques in solids and fluids, analysis of errors. Concurrent laboratory experiments and reports. Prerequisites: EnrE. 211, MatE. 102 and 103.
243. **Metallurgical Problems.** 4 hours. Theory and application of the laws of thermodynamics to metallic systems; problems concerning industrial and metallurgical processes. Prerequisite: EnrE. 201, and Chemistry Common Core sequence.
244. **Materials Processing II.** 3 hours. Principles and practices of casting and joining processes. Solidification of metals. Properties of mold materials. Diffusion bonding, brazing, and soldering. Prerequisite: MatE. 230.
245. **Materials Processing Laboratory II.** 1 hour. Experimental melting, casting, mold preparation, analysis of defects in sand, permanent mold, investment and shell casting, mold control, pattern design. Prerequisite: Credit or registration in MatE. 244.
246. **Numerical Control Processing.** 3 hours. Application of data processing to machine control, machine and tooling requirements. Computer utilization. Machine language. Machining techniques and control methods for efficient use of numerical control.
247. **Manufacturing Cost Analysis.** 3 hours. Techniques of economic analysis of mechanical processes, mechanical process planning, estimating, value engineering, inspection and quality standards, direct and indirect costs, amortization of capital expenditures, useful life of equipment, depreciation, salvage values.
248. **Materials Processing I.** 4 hours. Principles and practices of metal production and refining, heat treating, and surface treatments. Introduction to steelmaking,

hardenability concept, and carburizing, nitriding. Prerequisites: EnrE. 211 and MatE. 243.

249. **Materials Processing IV. 4 hours.** Mechanics of metal cutting. Application of metal removal principles in machining. Analysis and optimizing of metal cutting variables by use of computers. Tool and machine requirements in metal removal processes. Problems in plastic machining. Ceramic removal processes. Prerequisite: Credit or concurrent registration in MatE. 241.
250. **Physical Metallurgy I. 3 hours.** Part I of a three-course sequence. Principles and interpretation of phase diagrams; relationships between structure, thermal history, and properties. Prerequisite: MatE. 230.
251. **Physical Metallurgy II. 3 hours.** Part II of a three-course sequence. Fundamental treatment of mechanical properties. Elastic behavior. Plastic behavior of single crystals. Elements of dislocation theory. Plastic behavior of polycrystalline aggregates. Fracture. Prerequisite: MatE. 250.
252. **Physical Metallurgy III. 3 hours.** Part III of a three-course sequence. Diffusion, nucleation. Transformation kinetics. Creep and rupture. Oxidation and corrosion. Alloys of iron and carbon. Prerequisite: MatE. 251.
253. **Physical Metallurgy Laboratory I. 1 hour.** Part I of a three-course sequence. Demonstration of the principles of solidification, cold-working, annealing, and heat treatment of metals. Study of microstructures of simple binary alloys. Principles and techniques of metallography and photomicrography; analysis and interpretation of microstructures. Prerequisite: Registration in MatE. 250.
254. **Physical Metallurgy Laboratory II. 1 hour.** Part II of a three-course sequence. Demonstration of the principles of solidification, cold-working, annealing, and heat treatment of metals. Study of microstructures of simple binary alloys. Principles and techniques of metallography and photomicrography; analysis and interpretation of microstructures. Prerequisite: Registration in MatE. 251.
255. **Physical Metallurgy Laboratory III. 1 hour.** Part III of a three-course sequence. Demonstration of the principles of solidification, cold-working, annealing, and heat treatment of metals. Study of microstructures of simple binary alloys. Principles and techniques of metallography and photomicrography; analysis and interpretation of microstructures. Prerequisite: Registration in MatE. 252.
260. **Soil Behavior I. 3 hours.** Origin of soil deposits and mineral composition of soils. Soil classification. Soil compaction. Soil as a three-phase system: effective and neutral stresses, effective stress principle. Soil water: permeability, capillarity, frost heaving. Consolidation. Lectures and laboratory. Prerequisite: MatE. 103.
261. **Soil Behavior II. 3 hours.** The effect of subsurface soil conditions on choice of foundation. Subsurface soil exploration. Type of foundations: spread footings, mat, pile foundations. Proportioning foundations for settlement and bearing capacity. Earth pressures. Design of rigid retaining structures: retaining walls, bracing of excavations. Prerequisite: MatE. 260.

262. **Soil Behavior III.** 4 hours. Shear strength: failure theories; shear strength of sands, saturated and partly saturated clays. Analysis of embankments and earth dams for stable slopes. Analysis and design of flexible retaining structures. Lectures and laboratory. Prerequisite: MatE. 261.
272. **Measurement Reliability in Manufacturing.** 4 hours. Laboratory approach to the use of measuring instruments and equipment. Use of computer methods for reliability, prediction, and quality assurance. Quality control implications relating to measurement practice. Prerequisite: MatE. 246 or consent of the instructor.
281. **Design Project in Structural Mechanics.** 4 hours. Analytical or experimental design project in structural mechanics. Prerequisite: Senior standing.
283. **Design Project in Mechanical Analysis and Design.** 4 hours. Analytical or experimental design project in mechanical design. Prerequisite: MatE. 209.
291. **Undergraduate Seminar.** 2 hours. Students will conduct an in-depth study of areas of materials engineering which are of special interest to them. Oral and written reports are required. Prerequisite: Senior standing.
292. **Undergraduate Research.** 2 to 4 hours. Research under the close supervision of a faculty member. Prerequisite: Consent of the instructor.
302. **Applied Elasticity I.** 4 hours. Variational theorems of elasticity theory. Application to establishment and solution of approximate systems: beams (including shear deformations) and plates. Introduction to instability theory. Prerequisite: MatE. 205 or 206.
303. **Theory of Elasticity I.** 4 hours. The boundary value problems of linear isotropic elasticity theory. Uniqueness of solution. Reduction to two dimensions: the plane problem, torsion, bending. General orthogonal coordinates and special application to polar coordinates. Three-dimensional problems with axial symmetry.
304. **Experimental Stress Analysis.** 4 hours. Structural similitude and dimensional analysis. Brittle coating. Introduction to photoelasticity. Strain measurement techniques. Prerequisite: MatE. 206.
308. **Intermediate Vibration Theory.** 4 hours. Analytical and numerical treatment of vibrations induced in n -degree of freedom linear discrete systems by periodic, shock, and random excitation. Prerequisite: MatE. 208.
311. **Intermediate Dynamics.** 4 hours. Kinematics of point, space curves. Particle dynamics, orbital motion and stability. Moving reference frames. Rigid body dynamics: the inertia tensor, Euler's equations, application to gyroscopic motion. Hamilton's principle. Generalized coordinates. Lagrange's equations. Prerequisites: MatE. 102, Math. 220, or consent of the instructor.
312. **Nonlinear Oscillations.** 4 hours. Exact and approximate methods of studying vibrations of nonlinear systems. Analytical and graphical techniques. Forced oscillations, self-excited systems, stability criteria. Computer methods. Practical applications. Prerequisite: MatE. 208.

313. **Applied Dynamics. 4 hours.** Application of principles of dynamics to engineering physics. Balancing, rolling and sliding contact, static and dynamic force analyses of machine elements. Critical speeds. Impact loading. Prerequisite: MatE. 311 or consent of the instructor.
316. **Introduction to Continuum Mechanics. 4 hours.** Same as Energy Engineering 316. Cartesian tensors, kinematics of fluids and solids, conservation equations, constitutive equations for simple materials. Examples. Prerequisites: EnrE. 211 or MatE. 204, Math. 220.
321. **Structural Analysis II. 4 hours.** Establishment of basic equations governing linear structural systems. Matrix inversion and relaxation solutions. Approximate analyses. Introduction to dynamics of structures. Prerequisite: MatE. 207.
322. **Concrete Technology I. 4 hours.** Relations between microproperties and macroproperties; mechanisms of fracture, creep, and shrinkage; statistical aspects; air entrainment; special types of concrete. Individual research project involving laboratory and analytic techniques. 3 hours, lecture; 2 hours, laboratory. Prerequisite: MatE. 203 or the equivalent.
324. **Limit Analysis and Design of Structures. 4 hours.** Boundedness principles of perfect plasticity. Application to analysis and design of structures. Prerequisite: MatE. 207.
331. **Electron Theory of Metals. 3 hours.** Modern physical concepts of metals and alloys. Introduction to wave mechanics. Thermal, electrical, and magnetic properties of metals. Band theory of metals. Prerequisite: MatE. 252.
332. **Advanced Diffraction Analysis. 3 hours.** Single crystal methods in X-ray diffraction, orientation determination, pole figures, structure, determination, precision lattice constant methods. Prerequisite: MatE. 239 or the equivalent.
333. **Design Use of Materials. 4 hours.** Extreme value statistics. Mechanical effects of a notch. Fracture mechanics. Fatigue. Stress rupture. Residual stress effects. Relationships to designed performance. Prerequisite: MatE. 230.
334. **Metallurgy of Nuclear Materials. 3 hours.** Uses of materials for the production of nuclear energy, environmental problems associated with radiation damage, mechanical and physical property changes, swelling, poisoning, fission, moderation, neutron capture, and latent activity. Prerequisites: Phys. 114 and MatE. 252.
335. **Electron Microscopy. 3 hours.** The electron microscope and its application to the study of surface replicas and thin films of metals, alloys, and other materials. Sources of contrast. Selected area diffraction. Prerequisites: MatE. 239 and 252.
337. **Process Metallurgy of Iron and Steelmaking. 4 hours.** Physicochemical principles applied to reduction, conversion, and refining of steel and ferrous alloys. Applications of thermodynamics to equilibrium problems, such as slag-metal equilibria, and applications of process engineering principles to the dynamic behavior of various component systems, such as sinter plants, blast furnaces, and basic oxygen furnaces. Prerequisite: MatE. 243 or consent of the instructor.

338. **Particulate Solids Processing. 4 hours.** Characterization of particulate solids by size and shape. Size classification and reduction processes. Wet and dry separation processes. Transportation and agglomeration of particulate solids. Fluidized beds and fluidization. Prerequisite: EnrE. 234 or MatE. 248.
341. **Theoretical Soil Mechanics I. 3 hours.** Theories used in soil mechanics. Derivation of theoretical relationships and theoretical implications of empirical laws. Theories of deformation of soil systems; states of stress and deformation in soil masses; one-dimensional theory of consolidation for homogeneous and nonhomogeneous clay layers; seepage as a function of isotropy and homogeneity. Prerequisite: MatE. 260.
342. **Theoretical Soil Mechanics II. 4 hours.** Stresses and displacements in earth masses. The analysis of layered systems: analytical, finite difference, finite element methods. Settlement analysis: soil-structure interaction. Analysis of structural response of flexible and rigid pavements. Development of problem-oriented computer languages for settlements. Prerequisites: MatE. 341 and Math. 322.
343. **Theoretical Soil Mechanics III. 4 hours.** Seepage through earth masses: derivation of basic equations; analytical and numerical methods of solution; rapid draw-down. Stability of earth slopes: derivation of basic relationships; methods of Fellenius, Bishop, Morgenstern. Computer methods for slope stability and seepage: problem-oriented languages. Prerequisite: Math. 322.
344. **Physical-Chemical Principles of Soil Behavior I. 4 hours.** Clay mineralogy, soil formation and composition, sedimentation, mineral identification, colloidal phenomena in soils. Prerequisite: MatE. 260.
345. **Physical-Chemical Principles of Soil Behavior II. 4 hours.** Swelling, ion association, soil-water analysis of mechanical behavior of soils in terms of physiochemical principles conduction phenomena. Prerequisite: MatE. 344.
346. **Physical-Chemical Principles of Soil Behavior III. 4 hours.** Deformation mechanisms and strength, compaction, frost action, rate processes, such as secondary compression, creep, thixotropy. Prerequisite: MatE. 345.
360. **Deformation Processing. 4 hours.** Principles of deformation processes. Basic methods of problem solving. Practices and process control. Relations between processing and finished properties. Prerequisite: MatE. 230 or consent of the instructor.
361. **Deformation Processing Laboratory. 1 hour.** Measurement of flow stress and formability. Effect of friction in forging, rolling, and deep drawing. Effect of plastic anisotropy in deep drawing. Prerequisite: MatE. 360.
362. **Powder Metallurgy. 3 hours.** Physical attributes of fine powders. Mechanics of pressing. Theories of solid state sintering. Liquid phase sintering. Manufacturing aspects. Prerequisite: MatE. 230 or consent of the instructor.
363. **Advanced Phase Diagrams. 3 hours.** Ternary phase equilibria in metal systems. Vertical and horizontal sections, methods of construction and interpretation.

Examination of quaternary and more complex systems. Application of thermodynamic principles to construction. Prerequisite: MatE. 250.

384. **Design in Material Processes.** 3 hours. Design and optimization of chemical and mechanical metallurgical processing systems. Process modeling and analysis. Direct search linear and dynamic programming solutions of process problems. Economic analysis and investment strategy. Prerequisite: MatE. 243 or 244 or EnrE. 234.
391. **Seminar.** 1 hour. Topics to be arranged. Prerequisite: Consent of the instructor.
393. **Special Problems.** 2 to 4 hours. Special problems or reading by special arrangement with the faculty. Prerequisite: Consent of the instructor.

MATHEMATICS (Math)

100. **Algebra and Trigonometry I.** 5 hours. Credit is not given for Mathematics 100 if the student has credit in Mathematics 104. No graduation credit for engineering students. Fundamentals of algebra, factoring, fractions, radicals, exponents, solutions of equations, complex numbers, logarithms, progressions. Prerequisites: One unit of entrance credit in algebra and one unit in plane geometry. F, W, S, Su
101. **Algebra and Trigonometry II.** 5 hours. Credit is not given for Mathematics 101 if the student has credit in Mathematics 104 and/or 105. No graduation credit for engineering students. Mathematical induction, binomial theorem, inequalities, theory of equations, determinants, permutations and combinations, trigonometric functions, identities, equations, graphs. Prerequisite: Math. 100. F, W, S, Su
104. **College Algebra.** 5 hours. Credit is not given for Mathematics 104 if the student has credit in Mathematics 100. No graduation credit for engineering students. Theory of equations, systems of equations, determinants, complex numbers, permutations and combinations, mathematical induction, binomial theorem, progressions, inequalities, logarithms. Prerequisites: 1½ units of entrance credit in algebra and 1 unit in plane geometry. F, W, S, Su
105. **Trigonometry.** 3 hours. Credit is not given for Mathematics 105 if the student has credit in Mathematics 101. No graduation credit for engineering students. Restricted to students who have not had a formal course in trigonometry. Identities, equations, addition formulas and derived relations, solution of triangles, radian measure, graphs, inverse functions. Prerequisites: 1½ units of entrance credit in algebra and 1 unit in plane geometry. F, W, S, Su
106. **Mathematics for Elementary Teachers I.** 4 hours. Designed to prepare students to teach contemporary mathematics programs in the elementary schools. Prerequisite: Enrollment in the College of Education. F
107. **Mathematics for Elementary Teachers II.** 4 hours. Prerequisite: Math. 106. W
108. **Mathematics for Elementary Teachers III.** 4 hours. Prerequisite: Math. 107. S

110. **Finite Mathematics.** 5 hours. Statements and logic, sets, Boolean algebra, probability, vectors and matrices, linear programming, theory of games. Prerequisite: Math. 101 or 104 or the equivalent. F, W, S, Su
111. **Introduction to Analysis I.** 3 hours. For students in the College of Business Administration or the Department of Architecture; others, by consent of the department. Introduction to differential and integral calculus, together with sufficient material from analytic geometry to assist in the development and application of the calculus. Prerequisite: Math. 101 or 104 or the equivalent. F, W, S, Su
112. **Introduction to Analysis II.** 3 hours. For students in the College of Business Administration or the Department of Architecture; others, by consent of the department. Continues Mathematics 111. Prerequisite: Math. 111. F, W, S, Su
115. **Fundamentals of Mathematics I.** 4 hours. Survey course in mathematics: numbers and numerals, algebra, progressions, number theory. Prerequisites: 1 unit of entrance credit in algebra and 1 unit in plane geometry. F, W, S, Su
116. **Fundamentals of Mathematics II.** 4 hours. Survey course in mathematics: axioms of euclidean geometry, symmetry, perspective, Cartesian geometry, conic sections, noneuclidean geometry. Prerequisite: Math. 115 or consent of the instructor. F, W, S, Su
117. **Fundamentals of Mathematics III.** 4 hours. Survey course in mathematics: sets and logic, infinity, probability, statistics, calculus, computing machines. Prerequisite: Math. 116. F, W, S, Su
130. **Calculus and Analytic Geometry I.** 5 hours. Elementary analytic geometry. Introduction to differential and integral calculus and applications. Prerequisite: Math. 101 or 104 and 105 or the equivalent. F, W, S, Su
131. **Calculus and Analytic Geometry II.** 5 hours. The Riemann integral. Trigonometric and logarithmic functions. Integration in elementary terms. Polar coordinates and parametric equations. Prerequisite: Math. 130. F, W, S, Su
132. **Calculus and Analytic Geometry III.** 5 hours. Techniques of integration, numerical integration and inequalities for integrals, vectors and applications. Prerequisite: Math. 131. F, W, S, Su
133. **Calculus and Analytic Geometry IV.** 5 hours. Functions of several variables, partial derivatives, multiple integrals, infinite series and power series, improper integrals. Prerequisite: Math. 132. F, W, S, Su
170. **Introduction to College Mathematics I.** 5 hours. Arithmetic and algebra of signed numbers, single and simultaneous equations, properties of number systems, including estimation via the greatest integer function. Points, lines, segments, rays, and angles on a line and in a coordinate plane. Prerequisite: Approval of the department.

171. **Introduction to College Mathematics II.** 5 hours. Mathematical relations; mathematical relations compared to functions; elementary set theory; set theory and numbers; the absolute value functions; three-dimensional graphs; lattices; varycentric coordinance. Prerequisites: Math. 170 and approval of the department.
172. **Introduction to College Mathematics III.** 5 hours. Systems of quadratic equations, logarithmic and exponential functions, determinants, sequences and progressions, trigonometric functions, identities, inverse trigonometric functions, graphs, law of sines and cosines. Prerequisite: Math. 171. F, S
194. **Introduction to Automatic Digital Computing for Nontechnical Studies.** 3 hours. Credit is not given for both Mathematics 194 and 195; either serves as the prerequisite for more advanced programming courses. Programming a modern digital computer in a user-oriented language. Mathematics 194 is intended for students in curricula that do not require calculus; assigned problems assume only high school mathematics. F, W, S, Su
195. **Introduction to Automatic Digital Computing.** 3 hours. Credit is not given for both Mathematics 194 and 195; either serves as the prerequisite for more advanced programming courses. Programming a modern digital computer in a user-oriented language. Mathematics 195 is intended for students in curricula that require calculus; assigned problems assume the student is familiar with elementary calculus. Prerequisite: Math. 132. F, W, S, Su
198. **Special Topics in Mathematics.** 1 to 4 hours. May be repeated for credit. Course content will be announced prior to each quarter in which it is given. Prerequisite: Consent of the instructor. F, W, S
210. **Ideas in Mathematics.** 4 hours. Historical and intellectual aspects of some of the key ideas of pure and applied mathematics; interplay between the development of concepts in pure and applied mathematics. Prerequisites: Superior standing and consent of the instructor.
220. **Elementary Differential Equations I.** 3 hours. Systematic procedures for solving ordinary differential equations with emphasis on initial value problems of second order linear equations. Series solutions near ordinary and singular points. Introduction to the Laplace transforms and numerical methods. Prerequisite: Math. 133. F, W, S, Su
250. **Statistics for Engineers.** 5 hours. A first course in the use of statistical methods for interpreting the results of experiments. Probability and distributions, expectation, sampling and testing, estimation problems, chi-square tests, T and F tests, regression and correlation. Prerequisite: Math. 133. F, W, S
280. **Problem-Oriented Languages.** 3 hours. Study of several problem-oriented machine languages, such as ALGOL, PL/1, SNOBOL. Programming exercises using these languages. Prerequisite: Math. 194 and 195.
281. **Assembly Language Programming.** 3 hours. The logical organization of modern digital computers. Assembly language programming for such a machine. Prerequisite: Math. 194 or 195.

290. **Introduction to the Theory of Digital Machines.** 3 hours. The general organization of computers, number systems, Boolean algebra, design of combinational circuits, and sequencing of arithmetic operations. Prerequisite: Math. 195.
298. **Special Topics in Mathematics.** 1 to 4 hours. May be repeated for credit. Course content will be announced prior to each quarter in which it is given. Prerequisite: Consent of the instructor. F, W, S
300. **Teachers Course I.** 3 hours. Graduate credit for this course is restricted. See the Graduate College Catalog. Important concepts and the problems involved in the teaching theory; treatment of numeration systems, set relations, functions, whole numbers, logic, and proof, examination of some of the major new curricula. Prerequisite: Math. 133 or consent of the instructor. F, S
301. **Teachers Course II.** 3 hours. Graduate credit for this course is restricted. See the Graduate College Catalog. Continues Mathematics 300. Topics, discussed from an advanced viewpoint, include mathematical induction, the completeness axiom, composition of functions, sequences, a vector approach to geometry, axioms of the Hilbert type. Prerequisite: Math. 300 or consent of the instructor. W, Su
302. **Teachers Course III.** 3 hours. Graduate credit for this course is restricted. See the Graduate College Catalog. Continues Mathematics 301. Topics, discussed from an advanced viewpoint, include arithmetic and geometric progressions, continued sums and products, difference sequences, pigeon-hole principle, limits, continuity, exponential functions, logarithmic functions, circular functions, combinations and permutations. Prerequisite: Math. 301 or consent of the instructor. F, S
303. **Advanced Euclidean Geometry I.** 3 hours. Graduate credit for this course is restricted. See the Graduate College Catalog. Geometry from Euclid to the present, equivalents of Euclid's fifth postulate, noneuclidean geometries, finite and projective geometries, invariants of configurations under transformation. Prerequisite: Math. 133. F, S
304. **Advanced Euclidean Geometry II.** 3 hours. Graduate credit for this course is restricted. See the Graduate College Catalog. The parallel postulate, similarity, area, perpendicularity, circles and spheres, constructions with ruler and compass. Prerequisite: Math. 303. W, Su
305. **Advanced Euclidean Geometry III.** 3 hours. Graduate credit for this course is restricted. See the Graduate College Catalog. Ruler and compass constructions, proportionality, length and area, solid mensuration, hyperbolic geometry. Prerequisite: Math. 304. F, S
306. **Seminar in Mathematics for Teachers.** 3 hours. May be repeated for a total of 9 hours. Advanced topics and special problems in the teaching of precollege mathematics. Prerequisite: Math. 302.
307. **Theory of Sets and the Real Number System.** 5 hours. Elementary set theory and the development of the integers, the rational numbers, and the real numbers. Prerequisite: Math. 133. F, W, S, Su

310. **Higher Analysis I.** 4 hours. Real numbers, continuity, extensions of the mean value theorem, functions of several variables, partial derivatives. Prerequisite: Math. 133. F, W, S, Su
311. **Higher Analysis II.** 3 hours. Transformations, vectors, line and surface integrals. Prerequisite: Math. 310. F, W, S, Su
312. **Higher Analysis III.** 3 hours. Implicit functions, Riemann integration, infinite series, uniform convergence, power series, improper integrals. Prerequisite: Math. 311. F, W, S, Su
321. **Elementary Differential Equations II.** 3 hours. Systems of linear first order differential equations. Boundary value problems for second order linear equations, and introduction to partial differential equations. Nonlinear problems described by one or two differential equations of first order. Prerequisite: Math. 220. F, W, S, Su
322. **Elementary Partial Differential Equations I.** 3 hours. Second order linear partial differential equations and their initial value and boundary value problems. Separations of variables and Green's formula considerations. Eigenfunction expansions for homogeneous and inhomogeneous heat equation in finite domains. Sturm-Liouville problem. Fourier series. Prerequisites: Math. 310 and 321. F, W, S, Su
323. **Elementary Partial Differential Equations II.** 3 hours. The potential equation and the wave equation in finite domains. Semi-infinite domains. Fourier integrals. Cylindrical and spherical harmonics. Fourier-Bessel and Legendre-Bessel expansions. Prerequisite: Math. 322. F, W, S, Su
330. **Complex Analysis for Applications I.** 3 hours. Credit is not given for both Mathematics 330 and 332. Complex numbers and their geometrical representation, analytic functions, elementary functions, complex integration, Taylor and Laurent series, the calculus of residues, introduction to conformal mapping. Prerequisite: Math. 310. F, W, S
331. **Complex Analysis for Applications II.** 3 hours. Branch-point integration, series and product expansions, complex integral representations of special functions (gamma, hypergeometric, Legendre, Bessel), asymptotic methods, introduction to transforms. Prerequisites: Math. 321 and 330. W, S, Su
332. **Complex Variables I.** 3 hours. Credit is not given for both Mathematics 332 and 330. Power series in one variable, holomorphic functions, Cauchy's integral theorem. Taylor and Laurent expansions. Prerequisite: Math. 312. F, S
333. **Complex Variables II.** 3 hours. Analytic functions of several complex variables, harmonic functions, convergence of sequences of holomorphic functions, infinite products, normal families, holomorphic transformations, holomorphic systems of differential equations. Prerequisite: Math. 332. W, Su
340. **Modern Higher Algebra I.** 3 hours. Sets and real numbers, groups, rings. Prerequisite: Math. 133. F, W, S, Su

341. **Modern Higher Algebra II.** 3 hours. Euclidean and polynomial rings, vector spaces, linear transformations and matrices. Prerequisite: Math. 340. F, W, S, Su
342. **Modern Higher Algebra III.** 3 hours. Dual spaces, inner products spaces, modules, canonical forms of matrices, quadratic forms. Prerequisite: Math. 341. F, W, S, Su
343. **Formal Logic I.** 4 hours. Same as Philosophy 343. Propositional logic, logic of quantifiers, and identity and completeness. Individual conferences on assigned papers are required. Prerequisite: Consent of the instructor; none for mathematics majors. W
344. **Formal Logic II.** 4 hours. Same as Philosophy 344. Continues Mathematics 343. Mathematical analysis of decidability and computability. Arithmetization of syntax. Incompleteness and undefinability theorems. Introduction to axiomatic set theory. Individual conferences on assigned papers are required. Prerequisite: Math. 343. S
348. **Linear Transformations and Matrices.** 5 hours. Matrix algebra, determinants, inverses of matrices, rank and equivalence, linear independence, vector spaces and linear transformation, unitary and orthogonal transformations, characteristic equation of a matrix. Prerequisite: Math. 133. F, W, S, Su
350. **Introduction to Higher Geometry I.** 3 hours. Projective properties in the euclidean plane, extending the euclidean plane, the projective plane, axioms for the projective plane, conics, introduction of coordinates. Prerequisite: Math. 342.
351. **Introduction to Higher Geometry. II.** 3 hours. Topics in geometry, projective planes, higher dimensional projective geometries, model as subspaces of a vector space, coordinatization. Prerequisite: Math. 350.
353. **Introduction to Differential Geometry.** 3 hours. Curves, surfaces, manifolds imbedded in euclidean space, Riemannian geometry, first and second fundamental forms of imbedded surfaces. Prerequisite: Math. 312 or consent of the instructor.
355. **Introduction to Topology I.** 3 hours. Set theory, topological spaces, metric spaces, continuous maps, connectedness, compactness, separation axioms, completely separable spaces, mappings into Hilbert spaces. Prerequisite: Math. 310. F, S
356. **Introduction to Topology II.** 3 hours. Locally connected spaces, arcs and arcwise connectivity, Cantor sets, Hahn-Mazurkiewicz theorem, elements of homotopy theory. Prerequisites: Math. 340 and 355. W, Su
357. **Introduction to Topology III.** 3 hours. Vector spaces, polytopes, homology theory, Euler-Poincare formula, simplicial mappings, Brouwer degree and Brouwer fixed-point theorem. Prerequisite: Math. 356. F, S
360. **Elementary Theory of Numbers I.** 3 hours. The basic concepts of the theory of numbers: divisibility, prime numbers, congruences, quadratic reciprocity law. Prerequisite: Math. 133 or approval of the department.

361. **Theory of Numbers II.** 3 hours. Functions of number theory, recurrence functions, diophantine equations, quadratic forms, Farey sequences and rational approximations. Prerequisite: Math. 360 or consent of the instructor.
362. **Theory of Numbers III.** 3 hours. Continued fractions, distribution of primes, algebraic numbers, polynomials, partitions, density of sequences of integers. Prerequisite: Math. 361 or consent of the instructor.
370. **Introduction to Probability and Statistics.** 3 hours. Probability models, univariate and multivariate distributions, random variables. Prerequisite: Math. 133. F, W, S
371. **Statistics I.** 3 hours. Statistical problems and procedures, estimation, testing hypotheses, distribution theory. Prerequisite: Math. 370. W
372. **Statistics II.** 3 hours. One-sample problems, comparison, linear models, and analysis of variance. Prerequisite: Math. 371. S
375. **Probability.** 3 hours. Law of large numbers, central limit theorem, recurrent events, random walks, Markov chains. Prerequisite: Math. 370. F, W, S
377. **Finite Differences I.** 3 hours. Difference formulas, finite integration, summation of series, Bernoulli and Euler polynomials, interpolation. Prerequisite: Math. 112 or 113.
378. **Finite Differences II.** 3 hours. Approximate integration, beta and gamma functions, difference equations. Prerequisite: Math. 377.
381. **Vector and Tensor Analysis I.** 3 hours. Algebra of vectors, vector differential calculus, differential geometry, Stokes' theorem, divergence theorem, applications to electricity, mechanics, hydrodynamics, and elasticity. Prerequisite: Math. 311.
382. **Vector and Tensor Analysis II.** 3 hours. Transformation properties, covariant and contravariant tensors, differential geometry of curves and surfaces, exterior differential calculus with emphasis on aspects of interest in science and engineering. Prerequisite: Math. 381.
385. **Laplace Transforms.** 3 hours. The Laplace transform and its inverse; properties of the transform; linear differential equations (ordinary and partial); linear difference equations, gamma, error, and Bessel functions, asymptotic series, nonelementary integrals, integral equations, Hankel transforms. Prerequisite: Math. 330.
387. **Numerical Analysis I.** 3 hours. Mathematics 387 and 388 together provide a comprehensive introduction to linear numerical analysis. Computational methods and error analysis of matrix inversion, eigenvalues and eigenvectors, and linear approximations. Prerequisites: Math. 133 and either 194 or 195. F
388. **Numerical Analysis II.** 3 hours. Continues Mathematics 387. Prerequisite: Math. 387. W
389. **Numerical Analysis III.** 3 hours. Numerical integration and differentiation. Quadrature in n dimensions. Numerical integration of ordinary differential equations. Prerequisite: Math. 388. S

391. **Boolean Algebra and Switching Theory.** 3 hours. Sets, relations, functions, equivalence relations, abstract Boolean algebra. Applications of Boolean algebra. Minimization of Boolean functions. Representation of finite Boolean algebras. Prerequisite: Math. 310 or 340. F
392. **Introduction to Automata Theory.** 3 hours. Boolean rings and lattices as Boolean algebras. Synchronous sequential circuits. Mealy and Moore models of automata. Regular sets. Prerequisite: Math. 391. W
393. **Automata and Languages.** 3 hours. Types of automata and their events. The semigroup of an automaton. Basic decomposition theory. Introduction to formal languages. Grammars of types 0, 1, 2, 3. Properties of context-free languages. Prerequisite: Math. 392. S
394. **Simulation Languages.** 3 hours. Digital simulation of complex systems; general purpose and special simulation languages and their useful properties, their design and implementation; a comparison and evaluation of special languages, such as GPSS II, SIMSCRIPT, GASP, SIMPAC, DYNAMO, and SIMULATE; application of at least one of them in a term project. Prerequisites: Math. 280 and 281 or the equivalents.
395. **List-Processing Languages.** 3 hours. List- and string-processing languages (such as IPLV, SLIP, COMIT, SNOBOL, and LISP) from the user's point of view. Applications to nonnumeric problems, such as symbolic formula manipulation, information retrieval, and pattern recognition. Prerequisite: Math. 280 and 281 or the equivalents.
396. **Design of Compilers.** 3 hours. Design and implementation of algebraic compilers for a modern digital computer. Prerequisite: Math. 281.
397. **Computer Operating Systems.** 3 hours. Problems of planning and implementing an operating system for a modern digital computer so as to utilize its power to the fullest possible extent. Prerequisite: Math. 281.
398. **Special Topics in Mathematics.** 1 to 4 hours. May be repeated for credit. Course content will be announced prior to each quarter in which it is given. Prerequisite: Consent of the instructor.
399. **Honors in Mathematics.** 3 hours. May be repeated for credit. Seminars on special topics and advanced problems to permit students majoring in mathematics to do independent study under the guidance of senior members of the staff. Prerequisites: Math. 312 and 342 or consent of the instructor. F, W, S, Su

MILITARY SCIENCE (Mils)

100. 125. **Leadership Laboratory.** No credit. The laboratory develops the cadet's 135. 145. leadership characteristics by practical, progressive training in command and 155. 165. drill. The numerical sequence corresponds to the cadet's year-and-quarter 200. 225. progression and accomplishments: First-quarter freshman—Military Science

235. 245. 100; second-quarter freshman—Military Science 125, sequentially. Prerequisite: 255. 265. sites: Approval of the department, enrollment in appropriate nonmilitary academic course, and full-time status.

The Basic Course—100 series.

General Prerequisites for all basic courses: Enrollment in the R.O.T.C. program; 30 class hours of approved nonmilitary academic subjects per year; concurrent enrollment in the appropriate leadership laboratory.

101. **Organization and Mission of the United States Army R.O.T.C. and Weapons and Marksmanship.** 1 hour. Organization and function of the United States R.O.T.C., including its history, purpose, objectives, and military/civilian obligations as related to the defense establishment. Six hours of instruction are devoted to weapons and marksmanship, providing a practical working knowledge of individual weapons and their employment. Prerequisites: Approval of the department, enrollment in appropriate nonmilitary courses, and full-time status.
102. **The Defense Establishment in National Security.** 1 hour. Continues Military Science 101. Survey of the definition, causes, and principles of war. The evolution of weapons and warfare and the organization of military units directed toward understanding their capabilities, both tactical and supporting. Prerequisite: MilS. 101 or approval of the department.
103. **The Defense Establishment in National Security.** 1 hour. Continues Military Science 102. Survey of the Defense Department's organization and responsibilities and military forces under its control. Introduction to factors of national power, objectives, and policy, and the use of military assets across the spectrum of war. Prerequisite: MilS. 102 or approval of the department.
104. **Map Reading.** 1 hour. Fundamentals of military map reading; marginal information, map symbols, map orientation, and grid reference systems. Prerequisite: Approval of the department.
105. **Terrain Analysis, Aerial Photography, and Introduction to Tactics.** 1 hour. Continues Military Science 104. Aerial photography reading and interpretation, including terrain relationship and analysis. Introduction to small unit tactics. Prerequisite: MilS. 104 or approval of the department.
106. **Introduction to Tactics.** 1 hour. Continues Military Science 105. Application in the employment of squad and platoon units in offensive and defensive operations. Prerequisite: MilS. 105 or approval of the department.
107. **American Military History.** 1 hour. Survey of American military history from its origin through the Mexican War. The approach is analytical, with emphasis on leadership, the principles of war, and the growth of the military in the United States. Prerequisite: Approval of the department.
108. **American Military History.** 1 hour. Continues Military Science 107. From the American Civil War to World War I. Prerequisites: MilS. 107 and approval of the department.

109. **American Military History.** 1 hour. Continues Military Science 108. From World War I to the present. Prerequisites: MilS. 108 and approval of the department.

The Advanced Course—200 series.

General Prerequisites for all advanced courses: Junior standing; completion of the Military Science 100 series or the equivalent; 30 class hours of approved nonmilitary academic subjects per year; concurrent enrollment in the appropriate leadership laboratory.

201. **Military Teaching and Internal Defense Development.** 2 hours. Introduction to the principles, methods, and techniques fundamental to military instruction, including lesson planning and presentation, use of training aids, and methods of evaluation. Introduction to internal defense development. Prerequisite: See **General Prerequisites**, above.
202. **Branches of the United States Army.** 1 hour. Presentation of the branches of the Army with emphasis on their assigned special missions. Designed to provide students with sufficient information to select the branch of the service in which they desire to serve. Prerequisite: See **General Prerequisites**, above.
203. **Theory and Methods of Leadership.** 2 hours. Responsibilities and techniques of leadership; case studies in the psychological, physiological, and sociological factors which affect human behavior; individual and group solution of leadership problems common to small units. Prerequisite: See **General Prerequisites**, above.
204. **Introduction to Military Operations.** 2 hours. Introduction to the study of tactical operations and the various military teams; the coordination and planning necessary between the elements of the team. Prerequisite: See **General Prerequisites**, above.
205. **Advanced Military Operations.** 2 hours. The organization and employment of those units organic to the Army Divisions; joint Army, Air Force, and Naval operations; airmobile concepts. Prerequisite: MilS. 204.
206. **World Change and Military Implications.** 1 hour. Analysis of the elements influencing world change and the military implications associated with such change. The nature of international relations and comparison between the power of the United States and that of individual nations or groups of nations in terms of geography, economy, politics, sociology, and military factors. Prerequisite: See **General Prerequisites**, above.
207. **Command and Staff Functions.** 2 hours. Organization and function of the military staff. Acquisition and application of military intelligence. Introduction to logistics and maintenance procedures. Prerequisite: MilS. 205.
208. **Administration and Military Law.** 2 hours. Fundamental concepts of military justice; the principles and methods of courtroom procedures and nonjudicial punishment. Fundamentals of Army administration; latest trends and developments in equipment and procedures. Prerequisite: MilS. 207.

209. **Internal Defense Development; Service Orientation. 1 hour.** The six major operational roles which may be employed to accomplish stability objectives and the purposes, concepts, and modes of performing these roles. Customs of the service; conduct and code of the officer; management of personal affairs; discussion of requirements and problems inherent to entrance on active duty. Prerequisite: MilS. 203.
210. **Military Communications. 1 hour.** Means and principles of signal communication; codes, authentication, and communication security; characteristics, operation, and employment of radio and wire equipment; maintenance of signal communication equipment. Prerequisite: MilS. 106.

MUSIC (Mus)

100. **Fundamentals of Music Theory. 4 hours.** For the general student. Notation, metrical organization and rhythmic structure, scales and key signatures, intervals, triads, ear training, and sight singing. F, W, S, Su
101. **Theory of Music. 3 hours.** Summary of fundamentals of music theory, melodic analysis, introduction to harmony, and related keyboard drill. Prerequisites: Music major or minor or approval of the department; concurrent registration in Mus. 104 and 170. F
102. **Theory of Music. 3 hours.** Triads, dominant sevenths and their inversion; introduction to nonharmonic tones and elementary modulation; small two-part and three-part forms; harmonic analysis; related keyboard drill. Prerequisite: Mus. 101 or the equivalent. W
103. **Theory of Music. 3 hours.** Secondary dominants and nondominant sevenths, continuation of nonharmonic tones and modulation; larger binary and ternary forms; related harmonic analysis and keyboard drill. Prerequisite: Mus. 102 or the equivalent. S
104. **Ear Training. 1 hour.** The development of aural perception and sight-singing skills; material is correlated with that in Music 101. Prerequisite: Concurrent registration in Mus. 101. F
105. **Ear Training. 1 hour.** The development of aural perception and sight-singing skills; material is correlated with that in Music 102. Prerequisite: Mus. 104 or the equivalent. W
106. **Ear Training. 1 hour.** The development of aural perception and sight-singing skills; material is correlated with that in Music 103. Prerequisite: Mus. 105 or the equivalent. S
130. **Introduction to Music I. 4 hours.** For the general student. May not be taken for credit by music majors or minors. The principal elements of music; designed to develop an understanding of musical values. F, W, S, Su

131. **Introduction to Music II.** 4 hours. For the general student. May not be taken for credit by music majors or minors. A survey of principal style periods and their chief forms. Prerequisite: Mus. 130. W, S
151. **Concert Band.** ½ hour. Introduction to all types of band literature. Regular performances throughout the school year. Field trips may be required. Prerequisite: Consent of the instructor. F, W, S
152. **Orchestra.** ½ hour. Instrumental ensemble; performance of important instrumental literature of varied types. Prerequisite: Consent of the instructor. F, W, S
153. **Choir.** ½ hour. Introduction to important choral literature of all periods. Regular performances throughout the school year. Field trips may be required. Prerequisite: Consent of the instructor. F, W, S
154. **Chamber Choir.** ½ hour. Select group of approximately 30 singers. Performance of music literature of all periods, composed for small ensembles. Field trips may be required. Prerequisite: Consent of the instructor. F, W, S
155. **Madrigal Singers.** ½ hour. Small, very select group; performance of music literature primarily of the pre-Baroque periods. Prerequisite: Consent of the instructor. F, W, S
156. **Chorus.** ½ hour. Ensemble singing primarily for average and beginning singers. Stress on choral technique and vocal development. Prerequisite: Consent of the instructor. F, W, S
158. **Prep Band.** ½ hour. Designed for less experienced players who wish to meet required skills for concert band. Prerequisite: Consent of the instructor. F, W, S
159. **Jazz Laboratory Ensemble.** ½ hour. Practical experience in the preparation and performance of jazz compositions and arrangements; improvisational procedures. Regular performances throughout the school year. Field trips may be required. Prerequisite: Consent of the instructor determined by an audition.
170. **Piano I.** 2 hours. No more than 6 credit hours may be earned. Style and interpretation in performance; the development of keyboard skills in sight reading, transposition, improvisation, and ensemble playing. Must be repeated three times or until the minimum level of performance is certified by a departmental jury examination. Prerequisites: Music major or minor and approval of the department. F, W, S
171. **Piano II.** 2 hours. No more than 6 credit hours may be earned. Continues Music 170. Must be repeated three times or until the minimum level of performance is certified by a departmental jury examination. Prerequisite: Mus. 170 or approval of the department. F, W, S
201. **Theory of Music.** 3 hours. Continuation of nondominant seventh chords; introduction to ninth, eleventh, thirteenth chords, and chromatic harmony; analysis of single-movement forms; harmonic analysis of music from the eighteenth and early

nineteenth centuries; related keyboard drill. Prerequisite: Mus. 130 or the equivalent. F

202. **Theory of Music. 3 hours.** Continuation of chromatic harmony; harmonic and structural analysis of music from the middle to the late nineteenth century; related keyboard drill. Prerequisite: Mus. 201 or the equivalent. W
203. **Theory of Music. 3 hours.** Harmony from the late nineteenth to the early twentieth centuries; harmonic and structural analysis; related keyboard drill. Prerequisite: Mus. 202 or the equivalent. S
204. **Ear Training. 1 hour.** The development of aural perception and sight-singing skills; material is correlated with that in Music 201. Prerequisite: Mus. 106 or the equivalent. F
205. **Ear Training. 1 hour.** The development of aural perception and sight-singing skills; material is correlated with that in Music 202. Prerequisite: Mus. 204 or the equivalent. W
206. **Ear Training. 1 hour.** The development of aural perception and sight-singing skills; material is correlated with that in Music 203. Prerequisite: Mus. 205 or the equivalent. S
207. **Composition I. 4 hours.** Class and individual instruction in the basic techniques of musical composition. Practice in the construction of phrases and sentences leading to composition of music in the small forms. Prerequisites: Mus. 203 and 206. W
208. **Composition II. 4 hours.** Continues instruction in the basic techniques of musical composition. Experience in writing works of moderate scope for vocal and instrumental combinations ranging from solo to small ensemble. Prerequisite: Mus. 207. S
215. **Opera. 4 hours.** Historical survey tracing the growth and development of opera from its beginnings to the present day. Prerequisite: Sophomore standing. F
216. **Chamber Music. 4 hours.** May not be taken for credit by music majors or minors. The growth and development of chamber music from the Baroque period to the present. Prerequisite: Sophomore standing.
217. **The Symphony. 4 hours.** May not be taken for credit by music majors or minors. Historical survey of the growth and development of the symphony from its beginnings to the present. Prerequisite: Sophomore standing.
218. **The Concerto. 4 hours.** May not be taken for credit by music majors or minors. Historical survey tracing the growth and development of the concerto from its beginnings to the present day. Prerequisite: Sophomore standing.
219. **Keyboard Literature. 4 hours.** May not be taken for credit by music majors or minors. Historical survey tracing the growth and development of keyboard literature from Mozart through Debussy. Prerequisite: Sophomore standing.

220. **Expressionism.** 4 hours. Expressionism as one reaction to the cultural crisis of the early twentieth century centering on the music of Schonberg, Berg, and Webern. Prerequisite: Sophomore standing.
230. **Music History I.** 4 hours. Middle Ages and Renaissance. A general survey from monophony to 1600. Prerequisites: Junior standing and Mus. 103. F
231. **Music History II.** 4 hours. Baroque and classical. A general survey from 1600 to 1825. Prerequisite: Mus. 230. W
232. **Music History III.** 4 hours. Romantic and twentieth century. A general survey from about 1825 to the present. Prerequisite: Mus. 231. S
250. **Music for Elementary Teachers.** 4 hours. Open only to students in the College of Education. Required for state elementary teaching certificates. Materials and methods for teaching basic music concepts through creating and reading music; playing instruments, listening, singing; body movement. Prerequisite: Mus. 100 or proficiency examination. F, W, S
288. **The Intellectual Revolution of the Seventeenth and Eighteenth Centuries as Viewed Through the Arts.** 4 hours. Same as History of Architecture and Art 288 and Humanities 288. Evidence in the visual arts and music of the impact of the new cosmology on men's minds, imaginations, and emotions. Prerequisite: Sophomore standing.
289. **New Perceptions in Visual Arts, Music, and Science.** 4 hours. Same as Humanities 289. The extended sensory range of the twentieth century as represented in the visual arts, music, and science. Prerequisite: Sophomore standing.
299. **Individual Study.** 1 to 6 hours. May be repeated for credit for a maximum of 8 hours. Selected topics for individual investigation. Prerequisites: Mus. 203, 232, and approval of the department. F, W, S, Su
300. **Sixteenth-Century Counterpoint.** 3 hours. Late Renaissance music. Analysis of representative scores and written assignments in sixteenth century contrapuntal style. Prerequisites: Mus. 203 and 206 or approval of the department. F
301. **Eighteenth-Century Counterpoint.** 3 hours. Middle-to-late Baroque music. Analysis of representative scores and written assignments in eighteenth century contrapuntal style. Prerequisite: Mus. 300 or approval of the department. W
302. **Form and Analysis.** 3 hours. The melodic, rhythmic, harmonic, and structural analytic procedures of traditional musical form. Analysis of representative scores from the eighteenth to the twentieth centuries. Prerequisite: Mus. 301. S
303. **Compositional Techniques of the Twentieth Century.** 4 hours. European and American twentieth century music. Analysis of representative scores and written assignments in composition in one or more of the several contemporary idioms. Prerequisite: Mus. 302 or consent of the instructor.

320. **Proseminar in Music.** 2 to 4 hours. May be repeated for credit for a maximum of 12 hours. Selected topics for intensive study in specialized areas of musicology or music theory. Prerequisite: Senior standing as a music major.
330. **Music as Experience.** 4 hours. Study of the musical experience as found in the writings of theorists, composers, musicians, historians, critics, and philosophers. Prerequisites: Junior standing, Mus. 130, and one 200-level course in music.

NATURAL SCIENCES (NatS)

121. **Natural Sciences—The Physical Universe.** 4 hours. Same as Physics 121. For the nonscience major. The physical laws and the nature of matter, including relativity, the theory of the atom, and the motion of the planets. Prerequisite: High school algebra.
122. **Natural Sciences—The Evolving Earth in Its Universal Setting.** 4 hours. Same as Geological Sciences 122. Origin of the universe and elements, solar system, and earth-moon pair; history and processes of the earth's evolution. Prerequisite: NatS. 121 or consent of the instructor.
123. **Natural Sciences—Chemical Evolution: Protons to Proteins.** 4 hours. Same as Chemistry 123. Basic principles of organic chemistry; emphasis on the molecular basis of life. Prerequisite: NatS. 122 or consent of the instructor.
124. **Natural Sciences—Contemporary Biological Problems.** 4 hours. Same as Biological Sciences 124. Basic principles of evolution, genetics, biochemistry, and ecology; emphasis on biological problems of our society. Prerequisite: NatS. 123 or consent of the instructor.

PHILOSOPHY (Phil)

101. **Introduction to Philosophy.** 4 hours. Small-group conferences on assigned papers are required. Some of the more significant problems that arise in such philosophical disciplines as metaphysics, the theory of knowledge, and the philosophies of religion, science, and history.
102. **Elementary Logic.** 4 hours. Clarity and validity in argument; detection of fallacies; introduction to the use of symbolism in constructing proofs.
103. **Introduction to Ethics.** 4 hours. Small-group conferences on assigned papers are required. Examination of representative classical and modern ethical philosophies; their import for social and political thought.
150. **Classics in the Philosophy of Science.** 4 hours. Primary sources in the philosophy of science that have decisively influenced the development of modern science and Western thought since ancient times. Prerequisite: Sophomore standing.
200. **Basic Concepts and Problems.** 4 hours. Designed for philosophy majors or for preparation for advanced study in philosophy. Survey of basic concepts and

problems in epistemology, metaphysics, and value theory; extensive treatment of one or more problems from these fields. Prerequisite: One or more courses in philosophy or consent of the instructor.

201. **Ancient Philosophy. 4 hours.** The development of Greek and Roman philosophy. Prerequisite: Junior standing or two courses in philosophy.
202. **Medieval Philosophy. 4 hours.** Reading and discussion of selected philosophical works from St. Augustine through William of Ockham. Prerequisite: Junior standing or two courses in philosophy.
203. **History of Modern Philosophy. 4 hours.** The development of Western philosophy from Descartes through Kant. Prerequisite: Junior standing or two courses in philosophy.
206. **American Philosophy. 4 hours.** Main currents of philosophical thought in America. Prerequisite: One course in philosophy.
210. **Philosophic Problems in Art and Art Appreciation. 4 hours.** The nature of good painting and the characteristics of the reasons that can be offered in support of critical evaluations of works of art.
211. **Introduction to Formal Logic. 4 hours.** Not open to students who have taken Philosophy 321. Elementary theory and methods of symbolic logic. Prerequisite: One course in philosophy or one course in mathematics.
212. **Philosophy of Art. 4 hours.** Philosophical theories of art from ancient Greece to the present. Plato, Aristotle, Longinus, Hume, Kant, Nietzsche, Dewey, and others.
214. **Philosophy of Religion. 4 hours.** Philosophical inquiry into the grounds of religious belief and the character of religious experience. Prerequisite: One course in philosophy.
216. **Political and Social Philosophy. 4 hours.** Philosophical bases of social and political institutions and practices. The nature of the state; justice and law; rights and natural rights; social utility and public interest.
222. **Introduction to the Philosophy of Science. 4 hours.** The nature of scientific explanation and verification. The status of scientific theories; induction and probable inference.
224. **Philosophy of Education. 4 hours.** The nature and aims of education, the relationship of philosophical disciplines, such as ethics and theory of knowledge, to educational theory, and the application to pedagogy of various philosophical ideas and systems.
235. **Studies in Existentialist Literature. 4 hours.** Same as Humanities 235. Imaginative works by Dostoevsky, Rilke, Sartre, and Camus; selections from Pascal, Kierkegaard, Nietzsche, Jaspers, and Tillich. Prerequisite: Junior standing or consent of the instructor.

299. **Seminar. 4 hours.** May be taken twice. Selected topics. Prerequisites: Junior standing and approval of the department.
301. **Plato. 4 hours.** Selected dialogues. Prerequisite: Two courses in philosophy.
302. **Aristotle. 4 hours.** Reading and discussion of some of the basic works. Prerequisite: Two courses in philosophy.
303. **Chinese Philosophy. 4 hours.** Development of the major Chinese philosophies. Prerequisite: Two courses in philosophy.
304. **Seventeenth Century Rationalism. 4 hours.** Selected readings and discussion from the works of Descartes, Spinoza, Leibniz, and others. Prerequisite: Two courses in philosophy.
306. **British Empiricism. 4 hours.** Selected readings from the works of such philosophers as Locke, Berkeley, and Hume. Prerequisite: Two courses in philosophy.
308. **Kant. 4 hours.** Kant's philosophy, with emphasis on the *Critique of Pure Reason*. Prerequisite: Two courses in philosophy.
310. **Nineteenth Century and Early Twentieth Century Thought. 4 hours.** May be repeated for credit with the approval of the department. Selections from the writings of Hegel, Schelling, Fichte, Schopenhauer, Marx and Engels, J.S. Mill, Nietzsche, McTaggart, Green, Bradley, Peirce, Perry, and others. Prerequisite: Two courses in philosophy.
311. **Inductive Logic. 4 hours.** Traditional and contemporary problems of induction. Inductive logic and the theory of probability. Prerequisite: Phil. 211 or consent of the instructor.
312. **Recent and Contemporary Philosophy: Analysis and Logical Empiricism. 4 hours.** Developments in recent philosophy which have their roots in the study of logic and language, such as logical atomism, positivism, and analytical philosophy. Prerequisite: Two courses in philosophy. Phil. 211 is recommended.
313. **The Claims of Science and Religion. 4 hours.** Convergence and conflict between the results of science and the claims of religion; similarities and differences between their methods of inquiry. Prerequisites: Phil. 214 and one other course in philosophy.
314. **Recent and Contemporary Philosophy: Phenomenology and Existential Philosophy. 4 hours.** Important contributions to the phenomenological movement. Selected readings from Husserl, Heidegger, Jaspers, Sartre, Merleau-Ponty and others. Prerequisite: Two courses in philosophy.
321. **Introduction to Formal Logic. 4 hours.** Not open to students who have taken, or are taking, Philosophy 211. Four meetings per week coincide with Philosophy 211 (see Philosophy 211 description). One additional meeting per week devoted to an introduction to elementary set theory plus extra topics related to work in Philosophy 211.

322. **Problems in the Foundations of Logic and Mathematics.** 4 hours. A survey of selected problems. Prerequisite: Phil. 211 or the equivalent.
330. **Theory of Knowledge.** 4 hours. The grounds of belief; the nature of truth; evidence and proof; other related epistemological problems. Prerequisite: Two courses in philosophy, one of which must be a 200-level course.
332. **Ethics and Value Theory.** 4 hours. The nature of moral judgments and moral reasoning; ethics as a normative discipline; definitions of "value"; ethical judgments as a kind of value judgment. Prerequisite: Two courses in philosophy, one of which must be a 200-level course.
334. **Aesthetics.** 4 hours. The aesthetic object. Form, representation, and meaning in art. Art and knowledge. Prerequisite: Phil. 212 is recommended.
336. **Topics in Metaphysics.** 4 hours. Systematic analysis of selected metaphysical concepts, such as existence, substance and attribute, universals and particulars, change, identity, space and time, and the individual. Recent as well as traditional points of view are considered. Prerequisite: Two courses in philosophy, one of which must be a 200-level course.
338. **Philosophical Analysis of the Concept of Mind.** 4 hours. Presuppositions and logical interconnections involved in the use of such terms as "mind," "thought," "action," "intention," and "will." Prerequisite: Two courses in philosophy, one of which must be a 200-level course.
340. **Philosophy of Language.** 4 hours. Individual conferences on assigned papers are required. Philosophical and logical problems concerned with the nature of meaning and the structure of language. Prerequisite: Phil. 211 or 343 or some demonstration of familiarity with the techniques of symbolic logic. In the last case, consent of the instructor is required.
343. **Formal Logic I.** 4 hours. Individual conferences on assigned papers are required. Same as Mathematics 343. Propositional logic, logic of quantifiers, and identity and completeness. Prerequisite: Consent of the instructor; none for mathematics majors.
344. **Formal Logic II.** 4 hours. Individual conferences on assigned papers are required. Same as Mathematics 344. Continues Philosophy 343. Mathematical analysis of decidability and computability. Arithmetization of syntax. Incompleteness and undefinability theorems. Introduction to axiomatic set theory. Prerequisite: Phil. 343.
345. **Philosophical Problems of the Sciences.** 4 hours. May be repeated for credit with the permission of the department. Reading and discussion of selected works on the aims and methods of science, the status of scientific theories, natural laws and theoretical entities, and the nature of explanation. Prerequisite: Two courses in philosophy, one of which must be a 200-level course.
347. **Philosophy of Law.** 4 hours. Problems in the philosophy of law. Prerequisite: Two courses in philosophy.

351. **Problems in the Philosophy of Mathematics. 4 hours.** Intensive study of a particular problem or nexus of problems in the philosophy of mathematics. The problems will vary from quarter to quarter. Prerequisite: Phil. 343 or consent of the instructor; none for mathematics majors.
399. **Independent Study. 1 to 8 hours.** Independent study, under the supervision of a staff member, of a topic not covered in the regular curriculum. The course is offered at the request of the student and only at the discretion of the staff members concerned. Prerequisite: Approval of the department.

PHYSICAL EDUCATION (PE)

300. **Administrative Theory and Practice in Physical Education. 4 hours.** A theoretical approach to the development of administrative thought as it relates to physical education; emphasis on the understanding of concepts and models from the social sciences and their implications for leadership in the educational setting; development of a personal philosophy of administration. Prerequisite: PEM 260 or PEW 250.
301. **Evaluation in Physical Education. 4 hours.** The availability and value of evaluative tools in physical education; methods for administration of evaluative techniques; analysis of interpretation and use of the results from evaluative techniques; description of the construction of new evaluative instruments employed in physical education. Prerequisite: PEM 253 or PEW 205.
302. **Synthesis of Human Movement Concepts. 4 hours.** Integration of selected concepts from biomechanics, exercise physiology, psychology, and sociology as they apply to the development of meaningful human movement. Prerequisites: Senior standing and consent of the instructor.
303. **Instructional Techniques in Physical Education. 4 hours.** Theory and practice; special emphasis on the application of motor learning research to instructional techniques and teaching styles. Prerequisites: Senior standing and consent of the instructor.
305. **Special Projects in Physical Education. 2 to 4 hours.** Independent research on special projects. Prerequisite: Approval of the student's project by a graduate faculty member.
313. **Curriculum Construction in Physical Education. 4 hours.** Principles of curriculum development and evaluation; analysis of age characteristics, needs, interests, and goals of students in a variety of community settings and their implication for the curriculum; development of psycho-motor behavioral objectives for curricular offerings for various learning groups. Prerequisite: Ed. 230.

PHYSICAL EDUCATION FOR MEN (PEM)

100. **Developmental Activities. 1 hour.** Development and maintenance of physical fitness. Analysis of the effects and methods of exercise.
101. **Prescribed Exercises. 1 hour.** May be repeated for a total of 6 hours. Exercises adapted to individual needs, capacities, and interests. Open only to students assigned by the Health Service.
105. **Introduction to Dance. 1 hour.** Same as PEW 105. Designed specifically for students without previous dance experience. Man's use of movement as an art form. Introduction to technique, basis of dance styles. Experience with rhythm, form, space, and movement qualities through creative approaches to simple choreographic forms.
106. **Modern Dance I. 1 hour.** Same as PEW 103. Beginning modern dance. Elementary techniques from various modern dance styles. Experimentation with a variety of choreographic forms. Experience in the use of dance elements.
107. **Beginning Swimming. 1 hour.** Skills, knowledge, attitudes, and conditions. Open only to nonswimmers.
108. **Intermediate Swimming and Water Polo. 1 hour.** Improvement of swimming skills of those who swim inefficiently; development of skills necessary to play water polo reasonably well. Prerequisite: Ability to swim 50 yards.
109. **Advanced Swimming and Diving. 1 hour.** Development of skill in competitive swimming strokes and diving. Prerequisite: Ability to swim 200 yards.
110. **Life Saving and Skin Diving. 1 hour.** For students who wish to learn life saving skills and to develop the fundamental skills and knowledge for skin diving. The American Red Cross Senior Life Saving Certificate is awarded upon successful completion of the course. Prerequisite: Ability to swim, for 100 yards, three of these four strokes: back, breast, crawl, and side.
112. **Individual Tumbling Stunts. 1 hour.** Skills, knowledge, attitudes, and conditions.
113. **Double Tumbling Stunts. 1 hour.** Skills, knowledge, attitudes, and conditions.
114. **Apparatus Stunts. 1 hour.** Skills, knowledge, attitudes, and conditions.
115. **Circus Stunts. 1 hour.** Skills, knowledge, attitudes, and conditions.
116. **Saber Fencing. 1 hour.** Skills, knowledge, attitudes, and conditions. Prerequisite: PEM 119 with a grade of C or better or consent of the instructor.
117. **Boxing. 1 hour.** Skills, knowledge, attitudes, and conditions.
118. **Wrestling. 1 hour.** Skills, knowledge, attitudes, and conditions.

119. **Foil Fencing. 1 hour.** Skills, knowledge, attitudes, and conditions.
120. **Personal Defense Activities. 1 hour.** Skills, knowledge, attitudes, and conditions.
121. **Weight Training. 1 hour.** A program of weight training that contributes to improvement in strength and fitness. Prerequisite: Recommendation of the staff.
122. **Individual Athletics. 1 hour.** Skills, knowledge, attitudes, and conditions.
123. **Weight Lifting. 1 hour.** Skills, knowledge, attitudes, and conditions.
124. **Track and Field Athletics. 1 hour.** Skills, knowledge, attitudes, and conditions.
125. **Flickerball. 1 hour.** Skills, knowledge, attitudes, and conditions.
126. **Touch Football. 1 hour.** Skills, knowledge, attitudes, and conditions.
127. **Softball. 1 hour.** Skills, knowledge, attitudes, and conditions.
128. **Soccer. 1 hour.** Skills, knowledge, attitudes, and conditions.
129. **Volleyball. 1 hour.** Skills, knowledge, attitudes, and conditions.
130. **Basketball. 1 hour.** Skills, knowledge, attitudes, and conditions.
131. **Speedball. 1 hour.** Skills, knowledge, attitudes, and conditions.
132. **Archery. 1 hour.** Skills, knowledge, attitudes, and conditions.
133. **Squash Racquets. 1 hour.** Skills, knowledge, attitudes, and conditions.
134. **Handball. 1 hour.** Skills, knowledge, attitudes, and conditions.
135. **Tennis. 1 hour.** Skills, knowledge, attitudes, and conditions.
136. **Badminton. 1 hour.** Skills, knowledge, attitudes, and conditions.
137. **Bowling. 1 hour.** Skills, knowledge, attitudes, and conditions.
138. **Golf. 1 hour.** Skills, knowledge, attitudes, and conditions.
139. **Backyard Sports. 1 hour.** Skills, knowledge, attitudes, and conditions.
140. **Boating and Fishing. 1 hour.** Skills, knowledge, attitudes, and conditions.
141. **Modern Dance II. 1 hour.** May be repeated for credit. Same as PEW 104. Intermediate to advanced dance technique from modern dance styles. Improvisation and choreographic forms. Prerequisite: PEM 106 or consent of the instructor.
142. **Ballroom Dance I. 1 hour.** Same as PEW 142. Introduction to ballroom dancing. Basic steps and variations of the most common social dance styles.

143. **American Square Dance.** 1 hour. Same as PEW 143. Basic rhythms of square dance, etiquette and terminology, relation of round dances to American square dancing, appreciation of square dancing, several well-known American squares.
144. **Folk Dance—Elementary.** 1 hour. Same as PEW 144. Traditional rhythms of various countries, appreciation of the background.
145. **Modern Jazz I.** 1 hour. Same as PEW 145. Modern jazz development through creativity and structured movement. Prerequisite: PEM 103 or the equivalent.
146. **Ballet I.** 1 hour. Same as PEW 146. Introduction to classical ballet: basic techniques and terminology, appreciation, and historical development.
147. **Modern Jazz II.** 1 hour. May be repeated for credit. Same as PEW 147. Intermediate to advanced techniques and styles; choreographic principles; historical perspective in relation to contemporary usage. Prerequisite: PEM 145 or consent of the instructor.
148. **Ballet II.** 1 hour. May be repeated for credit. Same as PEW 148. Intermediate to advanced techniques; emphasis on principles, theories, and styles of performance; relationship to other art forms. Prerequisite: PEM 146 or consent of the instructor.
149. **Ballroom Dance II.** 1 hour. May be repeated for credit. Same as PEW 149. Advanced steps and variations. Prerequisite: PEM 142 or consent of the instructor.
170. **Fundamentals of Baseball.** 4 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, S
171. **Fundamentals of Basketball.** 4 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. W, S
172. **Fundamentals of Football.** 4 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, S
173. **Fundamentals of Gymnastics.** 2 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, W
174. **Fundamentals of Swimming.** 4 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. W, S
175. **Fundamentals of Track and Field Athletics.** 4 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, S
176. **Fundamentals of Wrestling.** 4 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, W
177. **Fundamentals of Special Activities.** 2 hours. Field sports and bowling. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, S

178. **Fundamentals of Special Activities.** 2 hours. Badminton, volleyball, and tennis. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, S
179. **Archery, Handball, Golf.** 2 hours. Skills, knowledge, attitudes, and conditions. Required for physical education majors. F, S
180. **Fitness Programs.** 4 hours. Fundamental skills, knowledge, and practice of physical conditioning. Required for physical education majors. F, W
185. **Introduction to Physical Education.** 3 hours. Physical education, health education, recreation, and related fields. Required for physical education majors. F, W, S
188. **History of Sports.** 4 hours. Development of sports and physical education in Europe and the United States since 1750. Required for physical education majors. W, S
190. **Principles of Recreation.** 4 hours. History of leisure and recreation; concepts of play and recreation; major recreation agencies.
191. **Camp Counseling.** 4 hours. The history and development of organized camping; examination of camp administrative organization; the role of the counselor. Analysis of program content and development; the nature and scope of counseling and guidance in relation to common camp behavior problems.
250. **Kinesiology.** 5 hours. Mechanics and muscular action of balance and movement of the human body and their applications. Required for physical education majors. Prerequisite: BioS. 133. F, W
251. **The Physiology of Muscular Activity.** 4 hours. The physiological mechanisms associated with physical exercise. Required for physical education majors. Prerequisite: BioS. 134. F, W
252. **The Theory of Prescribed Exercise.** 4 hours. Prescription and conduct of recreational and exercise programs for selected physical handicaps. Required for physical education majors. Prerequisite: BioS. 134. F, W
253. **Tests and Measurements in Physical Education.** 4 hours. The application of tests and measurements to physical education. The development of tests. Required for physical education majors. Prerequisite: PEM 185. W, S
255. **First Aid and the Prevention and Care of Athletic Injuries.** 4 hours. American Red Cross first aid. Diagnostic procedures for athletic injuries; treatment. Required for physical education majors. Prerequisite: BioS. 134. W, S
260. **The Organization of Physical Education Programs.** 3 hours. The high school physical education program. Required for physical education majors. Prerequisite: PEM 185. F, S

- 261. **The Organization of Athletic Programs. 3 hours.** The organization and administration of interscholastic athletic competition. Required for physical education majors. Prerequisite: PEM 185. F, S
- 262. **The Organization and Administration of Intramural Sports Programs. 3 hours.** Required for physical education majors. Prerequisite: PEM 185. W, S
- 280. **Student Coaching. 4 hours.** Coincides with student teaching. Preparation for, and supervised experience in, the field of coaching. Prerequisite: Concurrent registration in Ed. 270.
- 298. **Honors Seminar. 4 hours.** Same as PEW 298. Current problems and issues in physical education. Prerequisites: Junior standing and a cumulative 4.0 average.

PHYSICAL EDUCATION FOR WOMEN (PEW)

- 100. **Conditioning Activities. 1 hour.** Maintenance and improvement of physical fitness through exercise and body control.
- 102. **Modified Activities. 1 hour.** For students assigned by the Health Service. Students with physical disabilities participate according to their abilities.
- 103. **Modern Dance I. 1 hour.** Same as PEM 106. Beginning modern dance. Elementary techniques from various modern dance styles. Experimentation with a variety of choreographic forms. Experience in the use of dance elements.
- 104. **Modern Dance II. 1 hour.** May be repeated for credit. Same as PEM 141. Intermediate to advanced dance techniques from modern dance styles. Improvisation and choreographic forms. Prerequisite: PEW 103 or consent of the instructor.
- 105. **Introduction to Dance. 1 hour.** Same as PEM 105. Designed specifically for students without previous dance experience. Man's use of movement as an art form. Introduction to the technique basis of dance styles. Experience with rhythm, form, space, and movement qualities through creative approaches to simple choreographic forms.
- 107. **Apparatus. 1 hour.** Vaulting over side horse; basic skills and routines for uneven bars and balance beam.
- 108. **Free Exercise. 1 hour.** Components of free exercise: basic ballet, locomotor patterns, and tumbling; their use in routines.
- 110. **Beginning Swimming. 1 hour.** For students who are afraid of the water and unable to float or to swim. Water adjustment, floating, front crawl, and back crawl.
- 111. **Advanced Beginning Swimming. 1 hour.** Front crawl, back crawl, elementary back stroke, treading, floating, and plain front dive. Prerequisite: Front and back float.

112. **Intermediate Swimming. 1 hour.** Side stroke, breast stroke, surface dive. Review of front and back crawl and elementary back stroke. Prerequisite: Ability to swim one pool length (25 yards) each of the front crawl, the back crawl, and the elementary back stroke.
113. **Advanced Swimming. 1 hour.** Springboard dive, all basic swimming strokes, and the butterfly. Emphasis on endurance. Some racing techniques and synchronized swimming. Prerequisite: Ability to swim 25 yards of the front crawl, back crawl, elementary back stroke, breast stroke, and side stroke.
115. **Synchronized Swimming. 1 hour.** The practice and presentation of strokes, stunts, sculling, and composition. Prerequisite: Intermediate swimming ability.
116. **Beginning Diving. 1 hour.** Springboard dive, back dives, somersault and twisting dives. Prerequisite: Ability to swim and execute a plain front dive from the side of the pool.
117. **Senior Lifesaving. 1 hour.** Lifesaving and swimming skills for those interested in working in the field of aquatics. Prerequisites: Ability to execute a surface dive and to swim three strokes for 200 yards in good form.
118. **Advanced Synchronized Swimming. 1 hour.** Practice and presentation of strokes and advanced synchronized swimming skills; emphasis on creativity. Prerequisite: PEW 115 or consent of the instructor.
120. **Elementary School Game, Self Testing, and Rhythmic Skills. 2 hours.** Analysis and development of skills used in the physical education program in the elementary school. Prerequisite: Sophomore standing.
122. **Speedball. 1 hour.** Fundamentals of team play based on the development of individual game skills.
123. **Basketball. 1 hour.** Skills and knowledge in beginning basketball.
124. **Volleyball. 1 hour.** Development of skill in volleyball play, knowledge of rules, refereeing.
125. **Softball. 1 hour.** Skills and knowledge.
126. **Field Hockey. 1 hour.** Skills, rules, and strategy.
127. **Soccer. 1 hour.** Skills, rules, and strategy.
128. **Advanced Volleyball. 1 hour.** Advanced techniques and team play. Prerequisite: PEW 124 or consent of the instructor.
130. **Badminton. 1 hour.** Development of skills, knowledge of rules, tournament play.
131. **Beginning Golf. 1 hour.** Historical development, values, rules, etiquette, and skill techniques. Use of woods, irons, and putters.

132. **Bowling. 1 hour.** Development of skills.
133. **Fencing. 1 hour.** Fundamentals of foil fencing: mechanical principles, body movements, competition strategy. Prerequisite: PEW 100.
134. **Intermediate Fencing. 1 hour.** Skills, rules, tactics, officiating techniques, and competition. Prerequisite: PEW 133 or consent of the instructor.
135. **Archery. 1 hour.** Knowledge, skills, and practice.
136. **Tennis. 1 hour.** Development of skills, knowledge of rules, tournament play, and procedures.
137. **Advanced Tennis. 1 hour.** Advanced skills. Emphasis on singles and doubles strategy. Prerequisite: PEW 136 or consent of the instructor.
138. **Track and Field. 1 hour.** Basic knowledge and skills.
141. **Stunts, Tumbling, and Apparatus. 1 hour.** Simple stunts and tumbling. Basic and intermediate levels of use on horse, buck, parallel bars, trampoline, and balance beam.
142. **Ballroom Dance I. 1 hour.** Same as PEM 142. Introduction to ballroom dancing. Basic steps and variations of the most common social dance styles.
143. **American Square Dance. 1 hour.** Same as PEM 143. Basic rhythms of square dance, etiquette and terminology, relation of round dances to American square dancing, appreciation of square dancing, several well-known American squares.
144. **Folk Dance—Elementary. 1 hour.** Same as PEM 144. Traditional rhythms of various countries, appreciation of the background.
145. **Modern Jazz I. 1 hour.** Same as PEM 145. Modern jazz development through creativity and structured movement. Prerequisite: PEW 105 or the equivalent.
146. **Ballet I. 1 hour.** Same as PEM 146. Introduction to classical ballet: basic techniques and terminology, appreciation, and historical development.
147. **Modern Jazz II. 1 hour.** May be repeated for credit. Same as PEM 147. Intermediate to advanced techniques and styles; choreographic principles; historical perspective in relation to contemporary usage. Prerequisite: PEW 145 or consent of the instructor.
148. **Ballet II. 1 hour.** May be repeated for credit. Same as PEM 148. Intermediate to advanced techniques, emphasis on principles, theories, and styles of performance; relationship to other art forms. Prerequisite: PEW 146 or consent of the instructor.
149. **Ballroom Dance II. 1 hour.** May be repeated for credit. Same as PEM 149. Advanced steps and variations. Prerequisite: PEW 142 or consent of the instructor.

150. **Professional Orientation.** 3 hours. To introduce physical education majors to the historical highlights, role of physical education in modern society, basic philosophical and scientific principles upon which the profession is founded, and to acquaint the student with professional organizations, literature, and career opportunities.
151. **Body Mechanics and Basic Movement.** 1 hour. Mechanics of body stabilization and movement; applications. Does not satisfy the general education requirement.
152. **Soccer and Speedball.** 1 hour. Skill techniques, rules, and basic techniques of officiating; strategy; movement analysis. Does not satisfy the general education requirement.
153. **Stunts and Tumbling.** 1 hour. Basic skills, routines, practice, and teaching methods. Does not satisfy general education requirement.
154. **Volleyball, Track, and Field.** 1 hour. Basic skills, techniques, tournament play, and volleyball officiating. Basic skills of track and field activities; shot, ball throwing, and running activities. Does not satisfy the general education requirement.
155. **Gymnastics and Apparatus I.** 1 hour. Skill, practice, and movement analysis. Does not satisfy the general education requirement.
156. **Swimming II.** 1 hour. Advanced skills; emphasis on teaching progressions. Does not satisfy the general education requirement. Prerequisite: PEW 110, 111, 112, 113 or 115.
157. **Basketball I and Softball.** 1 hour. Skills, rules, and tactics in beginning basketball and softball; movement analysis. Does not satisfy the general education requirement.
159. **Basketball II and Field Hockey.** 1 hour. Skill techniques; rules and basic techniques of officiating; strategy; movement analysis. Does not satisfy the general education requirement. Prerequisite: PEW 157 or consent of the instructor.
166. **Elementary School Games.** 3 hours. For kindergarten through eighth grade playground and gymnasium activities. Program planning, lesson planning, and source materials. Open only to physical education majors.
168. **Gymnastics and Apparatus II.** 1 hour. Intermediate and advanced skills and routines. Does not satisfy the general education requirement. Prerequisite: PEW 155.
190. **Introduction to Recreation.** 3 hours. Analysis of the structure and function of the recreation of man: its philosophy, concepts, and trends. Institutionalized recreation leadership, activities, and programs.

195. **Outdoor Recreation.** 4 hours. Philosophy and principles underlying the methods and programs in outdoor recreation activities and events; special emphasis on outdoor education and enriching the leisure time program.
200. **Teaching of Dance and Gymnastics.** 4 hours. Foundations of learning rhythmic and gymnastic activities, teaching techniques, evaluation procedures, resource and teaching aids. Prerequisites: PEW 151 and Dance 100.
201. **Archery and Golf.** 2 hours. Elements of the skills, rules, and analysis of movement; opportunity for individual practice in game techniques. Does not satisfy the general education requirement.
202. **Theory and Practice of Rhythmic Gymnastics.** 2 hours. May be repeated for credit with approval of the department. Theory of European gymnastic systems. Applications of techniques of rhythmic gymnastics with light hand apparatus. Emphasis on systems studied will vary. Prerequisite: PEW 151.
203. **Badminton and Tennis.** 2 hours. Elements of the skills, rules, techniques of refereeing, and analysis of movement. Does not satisfy the general education requirement.
204. **Supervised Teaching of Dance and Gymnastics.** 2 hours. Laboratory experience in general education physical education classes under close supervision and guidance of staff members. Designed to give the student supervised observation and teaching experience in techniques, methods, and class management in dance or gymnastics. Assignment of classes by arrangement. Prerequisites: PEW 151, 155, 168, Dance 100 and 235.
205. **Tests and Measurements.** 4 hours. Laboratory experience designed to instruct the student in evaluation techniques for assessing skill, knowledge, motor achievement, physical fitness status. Elementary techniques of test construction, statistical methods, and research procedures. Prerequisite: Junior standing.
206. **Teaching of Swimming.** 2 hours. Methods of teaching beginning, intermediate, and advanced swimming and elementary diving. Prerequisite: PEW 156.
207. **Recreation Programs.** 4 hours. The essential elements involved in the organization and conduct of the recreation program; the importance of planning based on community needs, resources, and urban environment; the techniques and skills required for the promotion of a balanced and comprehensive program. Prerequisite: PEW 190.
208. **Leadership in Recreation.** 4 hours. The nature of leadership; its new dimensions and group interpersonal relationships in the recreation setting. Prerequisite: PEW 190.
213. **Teaching of Sports.** 4 hours. Relation of the teaching of sports to fundamental educational and psychological principles. Methods and materials for class management, sport instruction, and construction of unit and lesson plans. Prerequisites: PEW 151, 152, and 154 or consent of the instructor.

214. **Supervised Teaching of Sports. 2 hours.** Laboratory experience teaching in the general education physical education classes under the direct supervision of the staff. Designed to give the student guided opportunities to observe and acquire experience in technique, methods, and class management. Students will develop unit and lesson plans and will attend periodic seminars. Assignment of classes by arrangement. Prerequisites: PEW 151, 152, 154, and 213 or consent of the instructor.
220. **Elementary School Games and Self-Testing Activities. 2 hours.** For elementary education majors. Methods and materials applicable to all elementary grades. Prerequisite: Junior standing.
221. **Elementary School Rhythmic Activities. 2 hours.** For elementary education majors. Methods and materials applicable to all elementary grades. Prerequisite: Junior standing.
222. **Physical Education in the Elementary and Secondary School. 3 hours.** Curriculum planning, teaching methods, activities for different age groups, evaluation of materials, and organization for presentation. Prerequisites: PEW 166, Dance 100 and 235.
230. **Kinesiology. 5 hours.** Analysis of the mechanics of movement and muscular action and their relationship to human movement and balance. Prerequisites: BioS. 134, PEW 151.
231. **Adapted Physical Education. 4 hours.** A study of handicapping conditions found among students. Adaptation of exercises and activities to individual needs. Program planning. Prerequisite: PEW 230.
240. **Supervised Field Camping. 5 hours.** Practical supervised experience in the planning and conduct of camp programs and activities. Students are actively involved in the application of camping theory and techniques, utilizing suburban and city camp settings. Prerequisite: PEM 191.
250. **Organization and Administration of Physical Education. 4 hours.** Problems, evaluation, methods, and procedures of administration of school activities at various age levels. Individual projects are required. Prerequisite: Senior standing or consent of the instructor.
280. **The History of Sports. 4 hours.** Historical development of current sports, the role sports have played in the cultures of the world; effect of political and economic factors on practices in the conduct of sports. Prerequisite: Consent of the instructor.
281. **First Aid. 4 hours.** Safety and accident prevention in schools, playgrounds, and communities. American Red Cross procedures for administering first aid.
282. **The Organization of the School Health Program. 4 hours.** The development of school health programs, the function and use of health sciences, healthful school living, the problems and needs of school children. Individual projects are required.

283. **History of the Philosophy of Physical Education.** 4 hours. Individual projects are required. The developmental changes in the philosophy of physical education as influenced by historical changes in society and culture. Prerequisite: Senior standing or consent of the instructor.
298. **Honors Seminar.** 4 hours. Same as PEM 298. Current problems and issues in physical education. Prerequisites: Junior standing and a cumulative 4.0 average.

PHYSICAL SCIENCES (PSci)

101. **Physical Science.** 4 hours. Together with Physical Science 102 and 103 (either may precede the other), an introduction to the principles of the physical sciences. F, W, S, Su
102. **Physical Science.** 4 hours. Continues Physical Science 101. Prerequisite: PSci. 101. W, S
103. **Physical Science.** 4 hours. Continues Physical Science 101. Prerequisite: PSci. 101. F, S
299. **Topics in the Physical Sciences.** 2 to 4 hours. Credit will be determined by the number of meetings attended and scope of work as shown in the timetable. A colloquium intended to deepen understanding of the interrelations, effects, and choices created by large-scale science. Prerequisites: Superior standing and consent of the instructor.

PHYSICS (Phys)

101. **General Physics (Mechanics and Heat).** 5 hours. For students in the College of Liberal Arts and Sciences and in the Department of Architecture. Dynamics of solids and heat. Lectures with demonstrations and recitations; laboratory. Prerequisite: Trigonometry. F
102. **General Physics (Electricity, Magnetism, and Waves).** 5 hours. For students in the College of Liberal Arts and Sciences and in the Department of Architecture. Electricity and magnetism, particles and fields, electromagnetic waves, and behavior of waves. Lectures with demonstrations and recitations; laboratory. Prerequisite: Phys. 101. W
103. **General Physics (Modern Physics).** 5 hours. For students in the College of Liberal Arts and Sciences and in the Department of Architecture. Relativity, quantum mechanics, atomic structure, and the nucleus. Lectures with demonstrations and recitations; laboratory. Prerequisite: Phys. 102. S, Su

111. **General Physics I (Mechanics).** 4 hours. Scalars and vectors; kinematics in one and two dimensions, conservation of momentum; Newton's laws; inertial systems, circular motion; work, potential energy, conservation of energy; harmonic motion. Lecture and discussion. Prerequisite: Credit or registration in Math. 131. F, W, S, Su
112. **General Physics II (Mechanics, Thermodynamics).** 5 hours. Angular momentum, moment of inertia; gravitational force, planetary motion; introduction to the physics of fluids; first and second laws of thermodynamics; the ideal gas; kinetic theory of gases. Lecture, discussion, and laboratory. Prerequisites: Phys. 111 and credit or registration in Math. 132. F, W, S, Su
113. **General Physics III (Electricity and Magnetism).** 5 hours. Coulomb's law, Gauss' law; electrostatic field, potential; capacitance, resistance, D.C. circuits; the magnetic force, Biot-Savart law, Ampere's law; motion of charged particles in electromagnetic fields; electromagnetic induction. Lecture, discussion, and laboratory. Prerequisites: Phys. 112 and credit or registration in Math. 113. F, W, S, Su
114. **General Physics IV (Wave Phenomena and Relativity).** 5 hours. Displacement current, Maxwell's equations; basic wave behavior; the wave equation; sound, water, and electromagnetic waves; reflection, refraction, interference, diffraction; geometrical optics; introduction to the special theory of relativity. Lecture, discussion, and laboratory. Prerequisite: Phys. 113. F, W, S, Su
121. **Natural Sciences—The Physical Universe.** 4 hours. Same as Natural Sciences 121. For the nonscience major. The physical laws and the nature of matter, including relativity, the theory of the atom, and the motion of the planets. Prerequisite: High school algebra.
209. **Introduction to Astronomy.** 4 hours. Same as Geography 209. An introductory and essentially nonmathematical course for superior students who are not science majors. Prerequisite: Consent of the instructor.
221. **Modern Physics.** 4 hours. Kinetic theory, atomic nature of matter; thermal radiation, photons, photoelectric effect; atomic spectra, Bohr model of the atom; wave and particle aspects of matter; elements of nuclear and particle physics. Lecture and discussion. Prerequisite: Phys. 114.
222. **Modern Physics Laboratory.** 1 hour. Experiments in modern physics including the photoelectric effect, Franck-Hertz experiment, radioactive decays, and others. Laboratory. Prerequisite: Phys. 221.
291. **Seminar.** 1 hour. Topics to be arranged. Prerequisites: Senior standing and consent of the instructor.
292. **Undergraduate Research.** 2 to 4 hours. Research under the close supervision of a faculty member. Prerequisites: Senior standing and consent of the instructor.
293. **Special Problems.** 2 to 4 hours. Special problems or reading by special arrangement with the faculty. Prerequisites: Senior standing and consent of the instructor.

301. **Electricity and Magnetism I.** 4 hours. Vector calculus; electrostatic potential and fields in vacuum and material media; energy concepts; boundary value problems. Prerequisites: Phys. 114 and Math. 321.
302. **Electricity and Magnetism II.** 4 hours. Magnetostatics; vector potential; magnetic materials; time-varying fields and electromagnetic induction; Maxwell's equations. Prerequisite: Phys. 301.
303. **Electricity and Magnetism III.** 4 hours. Propagation of electromagnetic waves; reflection, refraction, and dispersion; guided waves; radiation; selected topics. Prerequisite: Phys. 302.
304. **Electronics I.** 4 hours. Theory of electronic devices, linear and nonlinear analysis, applications of vacuum and semiconductor devices to circuits, amplifiers, biasing, feedback, oscillators, and special circuits. Prerequisite: Phys. 301. Phys. 302 and 303 are recommended.
305. **Electronics II.** 4 hours. Pulse-shaping networks, logic circuits, control circuits, distributed amplifiers, special problems of transducers, special signal-to-noise techniques. Prerequisite: Phys. 304.
321. **Quantum Mechanics I.** 4 hours. The basic theory of the mechanics governing microscopic systems. Wave functions; probability density; operators; the Schrodinger equation with examples in one and three dimensions. Prerequisites: Phys. 114, 221 or approval of the department and Math. 220. Credit or registration in Math. 310 is recommended.
322. **Quantum Mechanics II.** 4 hours. Mathematical structure of quantum mechanics; observables for a quantum state; angular momentum; perturbation theory; the Born approximation; the variational method; transition probabilities. Prerequisite: Phys. 321. Credit or registration in Math. 311 is recommended.
323. **Elementary Solid State Physics.** 4 hours. Individual projects are required. Crystal structure, thermal and dielectric properties of solids, free electron model of metals, band theory, semiconductor physics, dislocations and strength of solids. Prerequisite: Phys. 322.
331. **Nuclear Physics.** 4 hours. Individual projects are required. Natural and artificial radioactivity, equipment for studying and producing high energy particles, nuclear disintegrations, interaction of nuclear particles with each other and with matter, cosmic rays, mesons, recent developments in high energy physics. Prerequisite: Phys. 321.
341. **Theoretical Mechanics I.** 4 hours. No credit for graduate physics majors. Individual projects are required. Motion of a particle in one, two, and three dimensions, Kepler's laws and planetary motion, scattering of particles, conversion between laboratory and center of mass coordinate systems, conservation laws, motion of a rigid body in two dimensions. Prerequisites: Phys. 114 or approval of the department and Math. 220.

342. **Theoretical Mechanics II. 4 hours.** Individual projects are required. Statics of extended systems, moving coordinate frames, fictitious forces and conservation laws, special theory of relativity, mechanics of continuous media. Prerequisite: Phys. 341.
343. **Theoretical Mechanics III. 4 hours.** Individual projects are required. Rigid-body motion in three dimensions, motion in gravitational fields, generalized coordinates and Lagrange and Hamilton equations, equations of constraint, small vibration theory. Prerequisite: Phys. 342.
361. **Thermal and Statistical Physics I. 4 hours.** Individual projects are required. Systems of particles, systems in equilibrium, laws of thermodynamics, thermal properties, application to simple physical and chemical systems, phase transitions, introduction to statistical mechanics. Prerequisite: Phys. 321.
362. **Thermal and Statistical Physics II. 4 hours.** Individual projects are required. Quantum statistics of ideal gases, magnetism and low temperatures, kinetic theory of transport processes, irreversible processes and fluctuations. Prerequisite: Phys. 361.
371. **Light (Wave Optics). 4 hours.** Wave propagation and Maxwell's equations, interference and interferometers, gratings, circular aperture, echelon, resolving power. Lecture and laboratory. Prerequisites: Phys. 114 and credit or registration in Math. 220.
372. **Light (Modern Optics I). 4 hours.** Crystals, polarized light, optics of metals, quantum theory of radiation, transition probability and oscillator strength, dispersion and scattering theory. Lecture and laboratory. Prerequisite: Phys. 371.
373. **Light (Modern Optics II). 4 hours.** Individual projects are required. Gaussian optics and general laws, special optical systems and applications. Image formation, finite image-error theory, spot diagrams. Necessary mathematical tools for Fourier analysis and transfer functions. Prerequisite: Phys. 372.
381. **Modern Experimental Physics I. 4 hours.** Techniques and experiments in the physics of atoms, atomic nuclei, molecules, the solid state, and other areas of modern physical research. Lecture and laboratory. Prerequisites: Phys. 304 and 331.
382. **Modern Experimental Physics II. 4 hours.** Continues Physics 381. Lecture and laboratory. Prerequisite: Phys. 381.

POLISH (Pol)

101. **Elementary Polish I. 4 hours.** Four additional half hours per week in the language laboratory. For students who have had no work in Polish. F, W, S
102. **Elementary Polish II. 4 hours.** Four additional half hours per week in the language laboratory. Continues Polish 101. Prerequisite: Pol. 101 or the equivalent. F, W, S

103. **Elementary Polish III.** 4 hours. Four additional half hours per week in the language laboratory. Continues Polish 102. Prerequisite: Pol. 102 or the equivalent. F, W, S
104. **Intermediate Polish I.** 4 hours. Reading, oral-aural practice, and systematic grammar. Prerequisite: Pol. 103 or the equivalent. Students who have not taken Polish 103 at this university must take the Polish placement test. F, W, S
105. **Intermediate Polish II.** 4 hours. Continues Polish 104. Prerequisite: Pol. 104 or the equivalent. Students who have not taken Polish 104 at this university must take the Polish placement test. F, W, S
106. **Intermediate Polish III.** 4 hours. Continues Polish 105. Prerequisite: Pol. 105 or the equivalent. Students who have not taken Polish 105 at this university must take the Polish placement test. F, W, S
221. **Introduction to Polish Literature I.** 4 hours. Major trends and authors from the Renaissance to Romanticism: Rey, Kochanowski, Potocki, Krasicki, and Boguslawski. Prerequisite: Junior standing or consent of the instructor. F
222. **Introduction to Polish Literature II.** 4 hours. Major trends and authors of the nineteenth century: Mickiewicz, Slowacki, Krasinski, Norwid, Fredro, Orzeszkowa, Sienkiewicz, and Prus. Prerequisite: Junior standing or consent of the instructor.
223. **Introduction to Polish Literature III.** 4 hours. Major trends and authors of the twentieth century: Tetmajer, Kaspruwicz, Staff, Lesmian, Wyspianski, Zeromski, Berent, Reymont, Brzozowski, Matuszewski, Tuwim, Slonimski, Wierzynski, Pawlikowska, Irzykowski, and Boy-Zelenski. Prerequisite: Junior standing or consent of the instructor.

POLITICAL SCIENCE (PoLS)

110. **The Government of Illinois.** 4 hours. The organization and powers of the major branches of the government of Illinois; relations with national and local governments; the legal, political, and administrative problems raised within the structure.
120. **The Study of Politics: Who Rules?** 4 hours. A basic course; prerequisite for many upper-division political science courses. Introduction to the concepts and methods of political analysis, philosophy, and action. Substantive focus on the selection of political leaders in various political systems, particularly in the United States today.
130. **Human Behavior and Politics.** 4 hours. Introduction to the variety of complex ways in which psychology is relevant to the study of politics. Major focus on the human need for power, respect, and security, and capacity for learning and perception; personality differences: authoritarianism, sociability, political style;

groups, proximal groups, national character, and political leadership roles. Emphasis on the links between man and his polity. Prerequisite: PolS. 120 or consent of the instructor.

150. **American Government: Basic Principles.** 4 hours. Historical development and operation of the American constitutional system. Analysis of federalism, civil liberties, and methods of popular control of government. It is strongly recommended that the student take both Political Science 150 and 151 to achieve minimal competence in this area.
151. **American Government: Organization and Powers.** 4 hours. Nature, structure, powers, and procedures of legislative, executive, and judicial departments in the state and in the nation. Basic structure of local government. Prerequisite: PolS. 150 (waived for education majors).
152. **Introduction to Comparative Study of Politics.** 4 hours. Principles of comparative political analysis and of the political systems of several countries outside of the United States.
155. **American Government: Basic Principles.** 4 hours. Honors course for Political Science 150. Prerequisite: University grade-point average of 4.00 or above or James Scholar status.
156. **American Government: Organization and Powers.** 4 hours. Honors course for Political Science 151. Prerequisite: PolS. 150 or 155 with James Scholar status or a 4.00 University grade-point average.
184. **Introduction to International Relations.** 4 hours. The basic characteristics of the international system, the nature of international relations, major problems and conflicts, the attempts to solve them. Nationalism, diplomacy, and war.
205. **Introduction to Urban Politics.** 4 hours. The growth of cities in the United States; legal problems of cities; intergovernmental relations; charters and charter drafting; powers and forms of government organization; politics and pressure-group activity; administrative organization; municipal functions and services; revenue problems. Prerequisite: PolS. 120 or 151 recommended.
212. **State Government.** 4 hours. Organization and powers of state governments in the United States; constitutions and problems of revision; legislatures and legislation; administrative problems; the state judiciary and judicial reform; intergovernmental relations; financing major services. Prerequisite: PolS. 120 or 151.
215. **Introduction to Marxism.** 4 hours. Examination of some of the basic works of Marx and Engels with the aim of determining the importance of Marxian analysis for contemporary politics.
226. **Political Parties.** 4 hours. Historical development, organization, and functioning of state and national parties; committees, conventions, campaigns, and finances; party platforms and issues. Prerequisite: PolS. 120 or 151 recommended.

230. **Political Behavior. 4 hours.** An introduction; includes analysis of voting behavior, political leadership, policy formation, and related matters.
234. **Comparative Government: Great Britain. 4 hours.** The government of Great Britain compared especially with that of the United States and the U.S.S.R. to illustrate and contrast the politics and governments of democracies and dictatorships.
235. **Comparative Government: The Soviet Union. 4 hours.** The nature, evolution, and problems of the political and economic systems of the U.S.S.R.
236. **Comparative Government: France and Germany. 4 hours.** Evolution of the political systems; analysis of reforms since 1945; operation of the governments and political parties.
240. **Political System of China. 4 hours.** Examination of Communist China's political system; analysis of techniques of political control, special reference to the roles of ideology and organization; China's foreign policy, emphasis on both the Sino-Soviet conflict and the Sino-American confrontation. Prerequisite: PolS. 120 or 152.
241. **Political Systems of Japan and Korea. 4 hours.** Political systems of contemporary Japan, North Korea, and South Korea. Analysis of their respective political institutions, processes, behaviors, and foreign policies. Prerequisite: PolS. 240 or consent of the instructor.
242. **Government and Politics of Latin America. 4 hours.** Comparative examination of the governments and politics of selected Latin American countries. Patterns of political leadership and followership, governmental processes, problems of development, and foreign political influence. Prerequisites: PolS. 120 or 151 or 152; 280 is recommended.
243. **Political Development of the Middle East. 4 hours.** Analysis of the contemporary politics of the countries of the Middle East, including the clash of traditional institutions and new social and political forces, such as Islam, nationalism, the military, political parties, and ideological trends. Prerequisite: PolS. 120 or 152; PolS. 280 is recommended.
245. **African Politics South of the Sahara. 4 hours.** Designed to provide the information and analytical tools to interpret current sub-Saharan African politics. Politics in traditional African societies; politics under colonial rule; the struggle for independence; postindependence politics. Prerequisite: PolS. 120 or 151; PolS. 152 and 280 are recommended.
246. **Political Patterns in West Africa. 4 hours.** Government patterns in West Africa, their evolution, and the underlying problems they are designed to meet. One-party African socialism, various forms of multiparty government, and military regimes.
247. **Race and Politics in East and South Africa. 4 hours.** The dilemmas which racially plural societies in East and South Africa face in their attempts to achieve

economic development, political stability, and social justice. Emphasis on Kenya, Tanzania, Rhodesia, and the Republic of South Africa. Prerequisites: PolS. 120 or 150 and one course in either anthropology or history.

250. **Special Problems in Politics.** 1 to 8 hours. May be repeated for a maximum of 8 hours. Independent study under the guidance of a staff member. Arrangements as to content, approach, and credit must be concluded with the staff member concerned. Prerequisites: Junior standing and three courses in social sciences or consent of the instructor.
251. **Symposium on Politics.** 1 to 8 hours. Course content and format is varied to adapt to the changing political scene.
255. **Courts, Color, and the Constitution.** 4 hours. The efforts of black Americans to attain equality under federal constitutional standards. Focus on the executive, legislative, and judicial application of the Thirteenth, Fourteenth, and Fifteenth Amendments to racial discrimination in public education, transportation, housing, recreation, public accommodations, and the right to vote. Attention is also given to the emerging "new civil rights." Prerequisites: PolS. 120 or 151 or consent of the instructor.
261. **Public Administration.** 4 hours. Introduction to the principal concepts, ideas, and issues in public administration; the evolution of administrative thought and practice in the United States; a conceptual scheme for analysis of bureaucratic structure and behavior; the human factor in administration; the politics of the budgetary process; the environmental constraints on bureaucratic organization. The contributions of behavioral science research are stressed. Prerequisite: PolS. 120 or 150.
262. **Organizational Behavior.** 4 hours. The nature and forms of politically relevant organizational behavior in modern society; particular emphasis on political environment of the organizations. Detailed analysis is made of one specific organization in its political-governmental setting. Prerequisite: PolS. 120 or 150.
263. **Comparative and International Administration.** 4 hours. Analysis of bureaucratic structure and behavior in selected countries; examination of the problems and practices of the international civil service. Consideration of a conceptual framework for comparative administrative analysis. Prerequisite: PolS. 261 or 286 or one course in comparative government.
280. **Introduction to the Politics of Developing Nations.** 4 hours. Comparative study of the political, economic, and social characteristics of underdeveloped nations. Colonialism, nationalism, political ideologies, and problems of effective political organization and functions. Prerequisite: PolS. 120 or 152 or two courses in social science.
281. **United States Foreign Policy.** 4 hours. Analysis of the internal and external factors which influence the formulation and execution of the foreign policy of the United States. Major problems of contemporary foreign policy; constitutional, organizational, administrative, and intellectual factors.

285. **Comparative Foreign Policies.** 4 hours. Comparative study of foreign policies of major nations and blocs of nations. Major national interests, substance of foreign policies, and methods of policy formulation. Prerequisite: PolS. 152 or 184.
286. **International Organization.** 4 hours. The evolution of international organizations; structure and operation of various types of contemporary international institutions. Special attention to the United Nations, its history, operations, and progress. Prerequisite: PolS. 184.
287. **International Law.** 4 hours. The theory and practice of international law; particular reference to its evolving role in the contemporary world. Decisions of international tribunals, past and present, are analyzed and the contributions of the United Nations to the progressive development of international law are examined. Prerequisite: PolS. 184 or consent of the instructor.
288. **International Relations of the Middle East.** 4 hours. Regional problems, such as the drive for Arab unity, the Arab-Israeli dispute, the role of the region in world politics, and the decline of Western influence in the area. Prerequisite: PolS. 184 or one course in modern diplomatic history at the 200 level or higher.
290. **Theories of Politics: Their Contributions and Limits I.** 4 hours. Examination and evaluation of some classical and contemporary theories of politics and the implications such theories have for an understanding of contemporary politics and political action. Particular emphasis is given to the possibility of scientific theories of politics and to the place of value judgments in theory construction. The theories of Thucydides, Plato, Aristotle, Augustine, David Easton, S.M. Lipset, and Hans Morgenthau are discussed.
291. **Theories of Politics: Their Contributions and Limits II.** 4 hours. Continues Political Science 290. Additional emphasis on deductive theories; John Locke and Rousseau. Aquinas, Machiavelli, Hobbes, J. Maritain, and Anthony Downs are also covered. Prerequisite: PolS. 290 or consent of the instructor.
292. **Theories of Politics: Their Contributions and Limits III.** 4 hours. Continues Political Science 291. Additional emphasis on interest group theories, elitism, and liberalism. James Harrington, David Truman, Edmund Burke, Karl Marx, C. Wright Mills, John Stuart Mill, and Christian Bay are covered. Prerequisite: PolS. 290 and 291 or consent of the instructor.
297. **American Political Thought.** 4 hours. Survey of the political thought of the colonial, revolutionary, constitution making, and Civil War periods; consideration of recent criticisms and defense of popular government as applied in the United States.
299. **Honors Course.** 2 to 4 hours. May be reelected for three quarters for a maximum of 10 hours. Open only to students majoring in political science. Independent reading and research. Prerequisites: Senior standing, University grade-point average of 4.00, and approval of the department.
301. **Educational Policy in Urban America.** 4 hours. Same as Education 301. Examination of selected urban phenomena in relation to educational bureaucracies and

school socialization processes. Emphasis on: historical investigation of strategies for protest and change employed by ghetto populations; conditions which fostered these strategies; responses of schools and other target institutions; social philosophical analysis of ideologies supporting both protest and response. Prerequisites: One course in the social foundations of education or the equivalent and consent of the instructor.

305. **Local Political Decision Making.** 4 hours. A research seminar. The problem of identifying and investigating political decisions in a major urban area like Chicago; an attempt is made to apply different theories of decision making to local politics. Prerequisite: PolS. 120 or 150.
306. **Ghetto Politics.** 4 hours. Individual conferences on assigned papers are required. Analysis of the political impact of the ghetto on local, state, and national political systems; the impotency of the ghetto voter; the ghetto politician; ghetto riots as political protest; the ghetto and presidential politics. Prerequisite: Three courses in political science or American history or sociology or consent of the instructor.
307. **Urban Politics Seminar.** 4 hours. Analysis of the structure and dynamics of political parties and organizations in urban areas. Intensive study of the power structure, strength, and weakness of the Democratic and Republican parties in urban areas, using Chicago and its suburbs as a laboratory. Prerequisites: PolS. 205 and consent of the instructor.
311. **Studies in Urban Public Policies.** 4 hours. The problems of governing metropolitan areas; special emphasis on evolving patterns of cooperation among governments in metropolitan areas, such as metropolitan federalism, city-county consolidation, councils of governments, and regional planning commissions. Prerequisite: PolS. 120 or 205.
315. **Legislatures and Legislation.** 4 hours. The legislative function in government; structure and organization of American legislatures, national, state, and local; party organization in legislatures; legislative procedure; pressure groups and lobbying; relation of the legislature to other branches of government; problems of legislative reorganization. Prerequisite: PolS. 120 or 205.
316. **The President and Congress.** 4 hours. Analysis of the relationship of the President and Congress and of the problems involved in the formulation and execution of public policy. Prerequisite: PolS. 120 or 205.
317. **Intergovernmental Relations.** 4 hours. The origin and evolution of the American federal system; federal-state constitutional relationships; intergovernmental fiscal relations; the political cultures; interstate relations; regionalism; state-local relations; interlocal relations and cooperative federalism in functional areas. Prerequisites: PolS. 151 and 205 or 212.
318. **Science, Technology, and Public Policy.** 4 hours. The impact of science and technology on governmental policy in the United States. Responses of the national executive and legislative branches of government; intergovernmental aspects of technological advances. Prerequisites: PolS. 151 and one advanced political science course or consent of the instructor.

319. **The Public Administration of Science and Technology. 4 hours.** The responses of public systems to the scientific and technological revolution; the governmental institutions being devised to administer science and technology in the public sector. Emphasis on technological problems caused by the emergence of new metropolitan communities.
327. **Public Opinion and Political Communication. 4 hours.** The nature of public opinion and political communication systems; patterns of opinion distribution and techniques for opinion measurement; forces shaping public opinion on public policy; comparison of political communication patterns in the United States with less developed and totalitarian nations. Prerequisite: 6 hours of advanced political science, sociology, or modern history.
328. **Propaganda and the Language of Politics. 4 hours.** The nature of propaganda, political symbols, and the language of politics; the uses of political symbols and propaganda in the political processes of democratic and totalitarian societies; international propaganda and psychological warfare; methods and uses of propaganda analysis. Prerequisite: Two courses in advanced political science, sociology, or modern history.
331. **Electoral Behavior. 4 hours.** Emphasizes two aspects of the study of electoral behavior: social, economic, and psychological theories developed specifically for, or adaptable to, the explanation of electoral behavior; introduction to inductive studies of voting behavior. Prerequisite: PolS. 230 or consent of the instructor.
332. **Quantitative Study of International Politics. 4 hours.** The usefulness of statistical reasoning in making inferences about international politics. Political decision making, political conflict and cooperation, and political development and change in terms of three basic levels of analysis: multi-national organization, nations, and international relations. Prerequisites: PolS. 184 and consent of the instructor.
334. **Political Socialization. 4 hours.** Introduction to the problems of how people learn about the polity; from whom they learn, under what circumstances, and with what consequences. Prerequisite: Three courses in political science, including at least one dealing with human political behavior, or consent of the instructor.
335. **Quantitative Study of Politics. 4 hours.** Introduction to descriptive and inductive techniques essential for understanding behavioral political science. Especially recommended for students who plan to take advanced courses in political behavior and related subjects. Prerequisite: PolS. 390.
336. **Film as a Research Technology in the Social Sciences. 4 hours.** The techniques and problems of film as a technology for generating, interpreting, and presenting data. Prerequisite: Consent of the instructor.
337. **The Politics of Alienation. 4 hours.** Conceptual, empirical, and normative analysis of alienation from polity, society, culture, and self. Focus on the political consequences of various forms of alienation, including radicalism, apathy, protest, revolution, renewal, and innovation. Empirical research is required. Prerequisite: PolS. 230.

- 351. Constitutional Law. 4 hours.** Constitutional provisions and principles as they have developed through Supreme Court interpretation; the amending process; federalism; commerce, taxing, and war powers; due process of law; the constitutional relations between the three major branches of government. Prerequisites: At least one introductory political science course.
- 353. Seminar: Problems of Constitutional Law. 4 hours.** Supervised individual study of selected problems arising in the interpretation of the United States Constitution. Prerequisites: PolS. 351 or 355 and consent of the instructor.
- 355. The Constitution and Civil Liberties. 4 hours.** The nature and constitutional positions of freedom of religion, speech, press, and others; varying interpretations of these freedoms; difficulties encountered in protecting them; problems of discrimination against racial, religious, and other minorities. Prerequisite: PolS. 151 or consent of the instructor.
- 356. Administrative Law. 4 hours.** Legal problems arising in the relationships between the citizen and the government official; administrative rule making and enforcement; judicial review of administrative actions. Prerequisite: Consent of the instructor.
- 362. Seminar: Public Administration. 4 hours.** Supervised individual study of selected problems. Prerequisite: PolS. 261 or 263.
- 381. Politics of Emerging Areas. 4 hours.** Analysis of selected governments and blocs of governments in Asia, Africa, and Latin America which represent different types of problems and different stages of the development process. Relations between underdeveloped and developed areas. Prerequisite: PolS. 280 or one course in non-Western politics.
- 388. Seminar: Problems in American Foreign Relations. 4 hours.** Supervised individual study of selected problems of contemporary United States foreign relations. Prerequisite: PolS. 281 or 284 or consent of the instructor.
- 390. Scope and Methods of Political Science. 4 hours.** Examination of the scope and subject matter of political science. Special attention to analytic processes in the development of concepts, hypotheses, and theories. Methodologies and modes of analysis now in use by political scientists. Prerequisites: PolS. 151 and one 200-level course in political science.
- 391. Political Power. 4 hours.** Examination of the nature of political power. The student is introduced to some of the major literature of power, and the development of the concept of political power as a descriptive category adequate to the comparative analysis of broader political phenomena, such as parties, official decision-making structures and movements. Prerequisites: PolS. 151 and 4 hours of 200 and 300 level political science courses or consent of the instructor.
- 392. Democratic Theory. 4 hours.** Democracy as a procedure of government and the value commitments associated with this form of government. Attention is given to corporate wealth, special interests, bureaucracy, and the mass media as they affect the existence of democratic government.

395. **Political Violence.** 4 hours. Seminar. Analysis of the use, or threat, of violence in the political process. Attention is focused on domestic forms of violence and aggression in various nations viewed cross-culturally. Prerequisites: PolS. 150 or 151 and two 4 hour courses in the social sciences.
398. **The Problem of Justice.** 4 hours. Same as Administration of Criminal Justice 398. The premodern view of justice, such as Plato's or Aristotle's; the modern understanding of justice, such as Hobbes' or Locke's, which is the foundation of the modern political regime; Rousseau's seminal political thought on justice, which is the basis of a variety of reforms and alternatives offered to Hobbes' and/or Locke's political regime. Prerequisite: Two courses in political science including PolS. 151.
399. **Seminar in Political Theory.** 4 hours. May be repeated for a total of 8 hours. In-depth analysis and discussion of selected problems or works in political theory. Prerequisites: PolS. 290, 291, and 292 or consent of the instructor.

PORTUGUESE (Port)

100. **Intensive Elementary Portuguese.** 8 hours. Two additional hours per day in the language laboratory. Special accelerated course, equivalent to Portuguese 101 through 102.
101. **Elementary Portuguese.** 4 hours. Two additional half hours per week in the language laboratory. For students without credit in Portuguese. Oral practice, reading, and grammar.
102. **Elementary Portuguese.** 4 hours. Two additional half hours per week in the language laboratory. Continues Portuguese 101. Prerequisite: Port. 101 or the equivalent.
103. **Elementary Portuguese.** 4 hours. Two additional half hours per week in the language laboratory. Continues Portuguese 102. Prerequisite: Port. 102 or the equivalent.
104. **Intermediate Portuguese.** 4 hours. Two additional half hours per week in the language laboratory. Rapid reading, grammar review, composition, conversation. Prerequisite: Port. 103 or two years of high school Portuguese.
105. **Intermediate Portuguese.** 4 hours. Two additional half hours in the language laboratory. Continues Portuguese 104. Prerequisite: Port. 104 or the equivalent.
106. **Intermediate Portuguese.** 4 hours. Two additional half hours in the language laboratory. Continues Portuguese 105. Prerequisite: Port. 105 or the equivalent.
110. **Intensive Elementary/Intermediate Portuguese.** 8 hours. Two additional hours per week in the language laboratory. Continues Portuguese 100. Special accelerated

course; work is equivalent to that in Portuguese 103 and 104 combined. Prerequisite: Port. 100, or 102 or the equivalent.

120. **Intensive Intermediate Portuguese. 8 hours.** Two additional hours per week in the language laboratory. Continues Portuguese 110. Special accelerated course; work is equivalent to that in Portuguese 105 and 106 combined. Prerequisite: Port. 110, or 104 or the equivalent.
170. **Masterpieces of Luso-Brazilian Literature in English Translation. 3 hours.** Same as Humanities 170. Representative works with background material.
171. **Readings in Luso-Brazilian Culture. 3 hours.** Same as Humanities 171. Selected topics. May be repeated for credit each quarter topics change.
299. **Independent Study. 1 to 6 hours.** May be repeated for credit. Open to qualified students interested in Luso-Brazilian studies. Prerequisites: Proficiency in Portuguese and approval of the department.

PSYCHOLOGY (Psch)

100. **Introduction to Psychology I. 4 hours.** Survey of the basic concepts of contemporary psychology in those areas of the field that emphasize man as a biological organism. Participation in actual research is provided.
101. **Introduction to Psychology II. 4 hours.** Survey of the basic concepts of contemporary psychology in those areas of the field that emphasize complex cognitive and social processes. Participation in actual research is provided. Prerequisite: Psch. 100.
104. **The Profession of Psychology. 4 hours.** Introduction to psychology as a profession in modern society; clinical practice, applications of psychology in work environments, and the influence of psychology on public policy. Prerequisite: Psch. 101.
143. **Introduction to Research in Psychology. 4 hours.** Techniques and problems associated with the study of behavior. Emphasis on measurement, descriptive statistics, and the principles of experimental design. Exercises involving data collection. Prerequisite: Psch. 101.
210. **Psychology of Personality. 4 hours.** Systematic study of the development, dynamics, and structure of personality; methodology, theory, and empirical research. Prerequisite: Psch. 143.
215. **Psychology of Attitude and Opinion. 5 hours.** Individual readings and projects are assigned. Same as Speech and Theater 215. Survey of behavioral approaches to the measurement of social attitudes and opinions; determinants and correlates of public attitudes and opinions. Lecture and participation in field and laboratory studies. Prerequisite: 8 hours of psychology or consent of the instructor.

220. **Psychology of Childhood and Adolescence.** 4 hours. Development of behavior in infancy, childhood, and youth. Emphasis on learning, motivational, and biosocial factors. Prerequisite: Psych. 143.
221. **Child Growth and Development.** 4 hours. Growth and development in infancy, childhood, and adolescence; emphasis on genetic, constitutional, and organic determinants in relation to environmental factors, particularly in early stages. Prerequisite: 8 hours of psychology or consent of the instructor.
222. **Psychology of Adulthood and Old Age.** 4 hours. Determinants of adjustment in marriage, educational and vocational pursuits, retirement, and old age; emphasis on learning, motivational, and biosocial factors. Prerequisite: 8 hours of psychology or consent of the instructor.
224. **Educational Psychology.** 4 hours. Basic undergraduate course in the psychology of education. Facts and principles of physical growth and development, learning, concept formulation, acquired motivation, and achievement testing applied to the classroom situation. Prerequisite: Psych. 143.
230. **Psychology in Business and Industry.** 4 hours. Application of the methods and findings of psychology to the study of people at work. Emphasis on problems of personnel selection, training, work methods, safety, motivation, labor-management relations, counseling, and related topics. Prerequisite: Psych. 143.
240. **Introduction to Psychological Testing.** 4 hours. Introduction to the principles of psychological testing, with a survey of representative techniques. Emphasis on concepts of objectivity, reliability, and validity. Lectures and conference section. Prerequisite: Psych. 143.
243. **Statistical Methods in Behavioral Science.** 4 hours. Credit is not given for Psychology 243 if the student has credit in Quantitative Methods 271. Introduction to statistical inference: probability distributions, sampling, hypothesis testing, and analysis of variance and nonparametric techniques. Emphasis on analysis of data from psychological research. Lectures and laboratory. Prerequisites: Psych. 143 and consent of the instructor.
247. **Differential Psychology.** 4 hours. The nature, determinants, and correlates of individual and group differences in behavior. Prerequisite: Psych. 143.
250. **Lectures in Perception.** 4 hours. Survey of theories and empirical findings in the study of sensation and perception. Emphasis on the contribution of experimental psychology to understanding the subjective experience of the physical environment. Prerequisite: Psych. 143.
251. **Lectures in Learning.** 4 hours. Principles of learning; emphasis on parameters of acquisition, extinction, and retention in basic learning paradigms. Prerequisite: Psych. 143.
252. **Lectures in the Psychology of Thinking.** 4 hours. Critical survey of experimental findings in verbal learning, problem solving, psycholinguistics, and conceptual behavior. Prerequisite: Psych. 143.

255. **Lectures in Social Psychology.** 4 hours. Survey of research and theory in representative areas of social psychology, including conformity, attitude development and change, social perception, conflict resolution, and group decision making. Emphasis on experimental investigation of behavior in social settings. Prerequisite: Psch. 143.
256. **Lectures in Physiological Psychology.** 4 hours. Research and theory concerned with the physiological bases of behavior. Understanding of basic brain organization and function is stressed; special emphasis on neural mechanisms of attention, emotion, motivation, and learning. Prerequisite: Psch. 143.
260. **Laboratory Course in Perception.** 4 hours. Laboratory practicum in sensation and perception. Prerequisites: Psch. 243, 250 and consent of the instructor.
261. **Laboratory Course in Learning.** 4 hours. Laboratory practicum in conditioning and simple learning; emphasis on the effects of motivational level and reinforcement contingencies. Prerequisites: Psch. 243, 251, and consent of the instructor.
262. **Laboratory Course in the Psychology of Thinking.** 4 hours. Laboratory practicum in verbal learning, psycholinguistics, problem solving, and conceptual behavior. Prerequisites: Psch. 243, 252, and consent of the instructor.
266. **Laboratory Course in Physiological Psychology.** 4 hours. Laboratory practicum; emphasis on research techniques of physiological psychology and the physiological correlation of behavior. Prerequisites: Psch. 243, 256, and consent of the instructor.
280. **Abnormal Psychology.** 4 hours. Forms and determination of behavior and personality disorders. Prerequisite: Psch. 210.
291. **Tutorial in Psychology.** 2 to 4 hours. May be repeated for a total of 8 hours. Seminar devoted to a preannounced topic suggested by students or faculty members. Suggestions for topics should be submitted in writing to the department office. Prerequisite: Psch. 143.
299. **Independent Research.** 2 to 6 hours. May be repeated for a maximum of 18 hours. Individual research investigation of a special problem under direction of a staff member. Prerequisites: Psch. 243, 4.0 grade-point average, consent of the instructor, and consent of the head of the department.
310. **Advanced Social Psychology.** 4 hours. Same as Sociology 315. Critical analysis of empirical research on social perception, communication and influence, group structure, role analysis, and socialization processes. Prerequisites: Soc. 185 or Psch. 243 and 16 hours in psychology or sociology.
315. **Psychology of Social Influence.** 4 hours. Methodology, results, and interpretations of studies of the influence of social variables on attitude development and modification, acculturation, perception, and judgment. Prerequisite: Graduate standing or consent of the instructor.

316. **Animal Behavior.** 4 hours. Principles and methods in the study of animal behavior; review of the social behavior of representative species in various phyla. Prerequisites: BioS. 100, 101, 102, and Psch. 143 or consent of the instructor.
317. **Social Development.** 4 hours. Theories and research on the effects of social evaluation, imitation and observational learning, and other social factors on the development of cognition, language, and attitudes in children and adolescents. Emphasis on the consequences of impoverished or atypical social environments. Prerequisites: Psch. 220 or the equivalent, and consent of the instructor.
318. **Experimental Social Psychology.** 4 hours. Critical survey of experimental studies of independence, power, influence, social learning and perception, and other aspects of social behavior. Laboratory practicum and demonstrations. Prerequisites: Psch. 115, 241, and 243 or the equivalents, and consent of the instructor.
323. **Psychology of the Exceptional Child.** 4 hours. Methods, results, and interpretation of studies of physically, intellectually, and emotionally deviant children; special reference to their implications for education and behavior modification. Prerequisite: 12 hours of psychology, including Psch. 220 or the equivalent, or consent of the instructor.
330. **Organizational Psychology.** 4 hours. Same as Management 330. Individual psychological and group processes and their interaction with organizational structure. Behavioral factors in effective organizational change. Prerequisites: Psch. 130 and one course in social psychology, or the equivalents.
332. **Personnel Psychology.** 4 hours. Systematic study of the development and utilization of psychological techniques of personnel selection, classification, and assessment. Prerequisites: 12 hours of psychology including Psch. 230; Psch. 240 or 243 or the equivalent; or consent of the instructor.
333. **Motivation and Morale in Industry.** 4 hours. Same as Management 333. Concepts and methods in the assessment and modification of employee motivation, attitudes, and morale. Prerequisite: 12 hours of psychology including Psch. 332, or the equivalent.
335. **Psychology of Industrial Training.** 4 hours. Same as Management 335. Psychological measurement techniques in assessing training needs and evaluating training effectiveness. Application of psychological techniques to the development of industrial training programs. Prerequisite: Psch. 332 or the equivalent.
338. **Psychology of Industrial Conflict.** 4 hours. Same as Management 338. Behavioral analysis of the causes, dimensions, and modes of resolution of industrial conflict, special emphasis on labor-management relations. Prerequisite: Psch. 330 or the equivalent.
343. **Advanced Statistics I.** 4 hours. Elementary probability theory, empirical and theoretical distributions, points and interval estimation, hypothesis testing. Prerequisite: 12 hours of psychology including Psch. 243 or the equivalent, or consent of the instructor.

345. **Psychometric Applications.** 4 hours. Theory of psychological tests and measurement applied to problems of ability and personality testing; opinion sampling; reliability and validity; prediction and selection processes. Prerequisite: 12 hours of psychology including Psych. 243 or the equivalent, or consent of the instructor.
350. **Learning and Conditioning.** 4 hours. Methods, results, and interpretation of experimental studies of basic learning processes in animal and human subjects. Prerequisites: Psych. 250 and 251 or the equivalents and consent of the instructor.
351. **Programmed Learning.** 4 hours. Theory and research in the techniques, applications, and results of programmed instruction. Prerequisite: 12 hours of psychology including Psych. 224 or the equivalent, or consent of the instructor.
352. **Motivation.** 4 hours. Methods, results, and interpretation of experimental studies of basic motivational processes in animal and human subjects. Prerequisites: Psych. 250 and 251 or the equivalents and consent of the instructor.
353. **Operant Conditioning.** 4 hours. Survey of basic principles and current research in the area of operant behavior. Prerequisite: Consent of the instructor.
354. **The Psychology of Language.** 4 hours. Same as Linguistics 354 and Speech and Theater 354. Introductory survey of methods, theory, and research; acquaints students with the history and present status of psychology's interest in language behavior. Prerequisite: Consent of the instructor.
355. **Higher Processes.** 4 hours. Methods, results, and interpretations of experimental studies of language behavior, problem solving, concept formation, and creativity. Prerequisites: 12 hours of psychology and consent of the instructor.
356. **Sensory and Perceptual Processes I.** 4 hours. Methods, results, and interpretation of experimental studies dealing with the determination of psycho-physical functions. Primary emphasis on the perception of single discrete stimuli and attributes of stimuli. Prerequisites: Psych. 250 and consent of the instructor.
357. **Sensory and Perceptual Processes II.** 4 hours. Methods, results, and interpretation of experimental studies dealing primarily with the role of contextual and experimental factors in perception. Prerequisites: Psych. 250 and consent of the instructor.
360. **Human Factors.** 4 hours. Application of experimentally derived principles of behavior to the design of equipment for efficient use and operation. Sensory and perceptual processes, motor skills, and experimental methodology. Prerequisite: 12 hours of psychology including Psych. 250 and 251 or the equivalents, or consent of the instructor.
361. **Instrumentation in Psychology.** 4 hours. Use of transducers, programming equipment, and recording systems in psychological research. Prerequisite: Graduate standing or consent of the instructor.
362. **Physiological Psychology.** 4 hours. Methods, results, and interpretation of experimental studies of physiological and neurochemical correlates of learning,

motivation, and perception. Laboratory demonstrations and problems. Prerequisite: Consent of the instructor.

363. **Behavioral Pharmacology. 4 hours.** Methods, results, and interpretation of experimental studies dealing with drugs and behavior. Emphasis on elucidating the role of drugs as tools in behavioral research and on the use of experimental psychology techniques to explicate drug action. Prerequisites: Psch. 251, 256, and consent of the instructor.
370. **Systems and Theories. 4 hours.** Critical introductory analysis of major historical systems and their representation in current theoretical issues. Prerequisites: Psch. 250 and 251 or the equivalents and consent of the instructor.
382. **Introduction to Psychological Assessment. 4 hours.** Systematic analysis of the nature of psychological tests and their application; introduction to intelligence, achievement, personality, and interest tests. Practice in administration and interpretation. Prerequisites: 12 hours of psychology including Psch. 243 or the equivalent and consent of the instructor.
399. **Problems in Psychology. 2 to 12 hours.** May be repeated. Individual research investigation of special problems under the direction of a staff member. Prerequisites: Consent of the instructor and approval of the head of the department.

QUANTITATIVE METHODS (QM)

270. **Statistics I. 4 hours.** The role of statistics in the scientific approach to decision making. Data sources, accuracy, precision. The concepts of average and dispersion as applied to samples and universes. Emphasis on modern aids to problem solving. Prerequisites: Math. 110, 111, and 112.
271. **Statistics II. 4 hours.** The nature and contributions of probability theory to the study of decision making under uncertainty. Probability distributions; sampling distributions. Concept and measurement of precision for pertinent statistics. Nonparametric statistics and their use in decision making. Prerequisite: QM 270.
272. **Statistics III. 4 hours.** Two and high dimensional considerations, regression analysis, time series, models, precision, strategy. Prerequisite: QM 271.
370. **Multivariate Analysis. 4 hours.** Theory and application of sampling from multivariate normal populations. Topics include such multivariate methods as multilinear regression, canonical correlation; analysis of variance and covariance; discriminant functions, structure of multivariate observations, both principal components and factor analysis. Prerequisites: QM 272, Math. 194 or 195, and Math. 348, or consent of the instructor.
371. **Survey Research. 4 hours.** Application of sampling theory and methods to planning, conducting, and evaluating surveys for measuring public opinion, consumer attitudes and preferences. Instruments of measurement, sample design

estimation, sources of errors and bias. Case studies with application to actual situations. Prerequisite: QM 272 or the equivalent.

375. **Information Systems. 4 hours.** An introduction to the theory and concepts of systems, including classification, deterministic and probabilistic models, Markov processes and Monte Carlo techniques, simulation. Introduction to the models as related to the computer; types of programming; experimentation and evaluation. Prerequisite: QM 272 or consent of the instructor. Math. 194 or 195 is recommended.
376. **Survey of Operations Research. 4 hours.** Methods, techniques, and applications; linear programming, simulation, production and inventory theory, queuing theory, game theory. Prerequisites: Math. 112 and QM 272.
378. **Dynamic Programming. 4 hours.** Theory and application to solving problems in multi-stage decision processes arising in a wide variety of fields such as operations research, engineering, and mathematics. Deterministic and random processes are considered, and computational and analytical methods of solution derived. Prerequisites: Math. 220 or the equivalent.

RHETORIC (Rhet)

101. **Freshman Rhetoric and Composition. 4 hours.** Elementary training and practice in the comprehension and expression of written English. W, S, Su, F
102. **Freshman Rhetoric and Composition. 4 hours.** Elementary training and practice in the comprehension and expression of written English. Prerequisite: Rhet. 101. W, S, Su, F
133. **Principles of Composition. 4 hours.** Practice in exposition; emphasis on organization, paragraphing, and sentence structure. Prerequisite: Grade of A or B in Rhet. 102 or consent of the instructor. W, S, Su, F
144. **Narrative Writing. 4 hours.** Provides practice in the writing of description, narrative sketches, stories. Prerequisite: Grade of A or B in Rhet. 102 or consent of the instructor. W, S, Su, F
180. **Introduction to Rhetoric. 4 hours.** May be repeated for a maximum of 12 hours. For students participating in the Educational Assistance Program. Basic grammar, sentence structure, organization and development of paragraphs and themes. W, S, Su, F
251. **Business Communication. 4 hours.** Study and practice in written informative and/or persuasive communications in business and industry. Prerequisite: Rhet. 102. W, S, Su, F

RHETORIC FOR FOREIGN STUDENTS (RhetF)

103. **English as a Foreign Language. 0 hours.** Intensive review of basic English structure for foreign students inadequately prepared for Rhetoric 101. Prerequisites: Reading knowledge of English, ability to understand instructions, and consent of the instructor.
104. **English as a Foreign Language. 0 hours.** Continues RhetF. 103. For students who may be inadequately prepared for Rhetoric 101. A rapid, intensive review of basic English structure; study of more complicated sentence patterns; practice in oral and written composition. Prerequisite: RhetF. 103 or consent of the instructor.
105. **English as a Foreign Language. 0 hours.** May be taken concurrently with Rhetoric 101. Intensive remedial writing for the foreign student in the area of his special difficulties. Prerequisite: RhetF. 104 or consent of the instructor. W, S

RUSSIAN (Russ)

101. **Elementary Russian I. 4 hours.** Four additional half hours per week in the language laboratory. For students who have had no work in Russian. F, W, S, Su
102. **Elementary Russian II. 4 hours.** Four additional half hours per week in the language laboratory. Continues Russian 101. Prerequisite: Russ. 101 or the equivalent. F, W, S
103. **Elementary Russian III. 4 hours.** Four additional half hours per week in the language laboratory. Continues Russian 102. Prerequisite: Russ. 102 or the equivalent. F, W, S
104. **Elementary Russian IV. 4 hours.** Four additional half hours per week in the language laboratory. Continues Russian 103. Prerequisite: Russ. 103 or the equivalent. F, W, S, Su
111. **Intensive Elementary Russian I. 8 hours.** Three additional hours per week in the language laboratory. For students who have had no work in Russian. Intensive elementary course which combines the material in Russian 101 and 102. F, W, S
112. **Intensive Elementary Russian II. 8 hours.** Three additional hours per week in the language laboratory. Intensive elementary course which combines the material in Russian 103 and 104. Prerequisite: Russ. 111 or the equivalent. F, W, S
115. **Intensive Russian Reading I. 8 hours.** Intensive elementary course for those students seeking reading ability in scientific or technical material in the humanities, social sciences, and natural sciences. Morphology, basic syntax, reading of texts, and the mechanics of translating from Russian. F, W, S
116. **Intensive Russian Reading II. 8 hours.** Continues Russian 115. Prerequisite: Russ. 115.

121. **Intermediate Russian I. 4 hours.** Four additional half hours per week in the language laboratory. Continues Russian 104. Prerequisite: Russ. 104, or 112, or 116 or the equivalent. F, W, S, Su
122. **Intermediate Russian II. 4 hours.** Four additional half hours per week in the language laboratory. Continues Russian 121. Prerequisite: Russ. 121 or the equivalent. F, W, S
131. **Russian Reading III. 4 hours.** Continues Russian 116. Intermediate course for those students seeking reading ability in scientific or technical material in the various sciences. Prerequisite: Russ. 116, or 104, or 112. F, W, S
132. **Russian Reading IV. 4 hours.** Continues Russian 131. Prerequisite: Russ. 131.
201. **Speaking and Writing Russian I. 4 hours.** Conversation and composition, systematic grammar, vocabulary development, aural comprehension, pronunciation drill, simple applied phonetics. Prerequisite: Russ. 122 or the equivalent. F
202. **Speaking and Writing Russian II. 4 hours.** Continues Russian 201. Prerequisite: Russ. 201 or the equivalent. W
203. **Speaking and Writing Russian III. 4 hours.** Continues Russian 202. Prerequisite: Russ. 202. S
204. **Corrective Russian Phonetics. 4 hours.** Pronunciation and intonation practice based on the theoretical understanding of acoustic and articulating phonetics as they pertain to Russian. Prerequisite: Russ. 122 or the equivalent. W
205. **Speaking and Writing Russian IV. 4 hours.** Continues Russian 203. Prerequisite: Russ. 203 or the equivalent.
206. **Speaking and Writing Russian V. 4 hours.** Continues Russian 205. Prerequisite: Russ. 205 or the equivalent.
207. **The Teaching of Russian in the Secondary School. 4 hours.** Modern techniques, including the language laboratory. Prerequisites: Russ. 203 and one course in Russian literature.
215. **Main Currents of Russian Thought I. 4 hours.** Literary, philosophical, and theological works, from the beginning to 1725; structured to acquaint the student with the main cultural forces that shaped Russian thought and manners. Given in English. Prerequisite: Junior standing or consent of the instructor. W
216. **Main Currents of Russian Thought II. 4 hours.** Continues Russian 215. Covering the period from 1725 to the October Revolution of 1917. Given in English. Prerequisite: Junior standing or consent of the instructor.
221. **Introduction to Modern Russian Literature I. 4 hours.** Early nineteenth century literature; special attention to the major works of Pushkin, Gogol, and Lermontov. Readings and lectures in English; selected readings in the original for

Russian language students. Prerequisite: Junior standing or consent of the instructor. F

222. **Introduction to Modern Russian Literature II.** 4 hours. Late nineteenth century literature, special attention to selected works by Turgenev, Tolstoy, Dostoevsky. Readings and lectures in English; selected readings in the original for Russian language students. Prerequisite: Junior standing or consent of the instructor. W
223. **Introduction to Modern Russian Literature III.** 4 hours. Early twentieth century literature: special attention to works by Chekhov, Bunin, Gorky, Sholokhov, Pasternak, and others. Readings and lectures in English; selected readings in the original for Russian language students. Prerequisite: Junior standing or consent of the instructor. S
224. **Introduction to Literary Analysis.** 4 hours. Selected masterpieces of Russian literature analyzed from the structural, thematic, historical, psychological/sociological, biographical, and linguistic points of view. Prerequisite: any one of the Russ. 221, 222, 223 sequence. W, S
230. **Studies in the Russian Short Story.** 4 hours. The Russian short story as a literary form. Close readings of selected short stories of the nineteenth century masters. Prerequisite: Junior standing or consent of the instructor. S, Su
260. **Russian for the Scientist.** 4 hours. May not be taken to fulfill foreign language graduation requirements. An accelerated course in the structure of Russian. Morphology, basic syntax, reading texts, and the mechanics of translating from Russian. For those seeking reading ability in scientific or technical material in the humanities and the social and natural sciences. Prerequisite: Junior standing. W
292. **The Structure of Serbo-Croatian.** 4 hours. Serbo-Croatian phonology, morphology, and syntax presented as a background and basis for comparison of the East Slavic and South Slavic branches of the Slavic languages. Su
299. **Independent Study.** 1 to 6 hours. May be repeated for credit. Prerequisites: Russ. 122 or the equivalent and approval of the department.
320. **Russian Poetry I.** 4 hours. Major poets from 1700 to 1840: Kantemir, Trediakovskij, Lomonosov, Derzavin, Fonvizin, Krylov, Pushkin, and others. Readings in Russian, discussion in English. Prerequisite: 24 hours of Russian, including two quarters of the 221, 222, 223 sequence, or consent of the instructor. F
321. **Russian Poetry II.** 4 hours. Major poets from 1840 to the 1890's: Zukovskij, Batjuskov, Gnedic, Katenin, Odoevskij, Lermontov, Nekrasov, Plesceev, Tjutcev, Fet, and others. Readings in Russian, discussion in English. Prerequisite: 24 hours of Russian, including two quarters of the 221, 222, 223 sequence, or consent of the instructor. W
322. **Russian Poetry III.** 4 hours. Major poets from the 1890's to the present: Merezhkovskij, Bal'mont, Sologob, Belyj, Blok, Axmatova, Mandel'stam, Esenin, Majakovskij, Pasternak, Tixonov, Simonov, Evtusenko, Voxnesenskij, Rozdestven-

skij, and others. Readings in Russian, discussion in English. Prerequisite: 24 hours of Russian, including two quarters of the 221, 222, 223 sequence, or consent of the instructor. S

324. **Studies in Russian Literary Criticism.** 4 hours. Belinskij, Chernishevskij, Herzen, Dobrolyubov, Pisarev, L.N. Tolstoy. Prerequisite: Russ. 224. S
332. **Grammar for Teachers.** 4 hours. Intensive study and review of problems of Russian grammar and syntax. Prerequisite: Russ. 201 or consent of the instructor. F
350. **Russian Novel I.** 4 hours. Historical and critical study of the development of the Russian novel from 1800 to about 1860: Pushkin, Lermontov, Gogol, Goncharov, Aksakov, Chernishevsky. Prerequisite: Junior standing or consent of the instructor. F
351. **Russian Novel II.** 4 hours. Continues Russian 350. Development from 1860 to about 1900: Turgenev, Alexey Tolstoy, Saltykov-Shchedrin, Lev Tolstoy, Dostoevsky, Leskov. Prerequisite: Junior standing or consent of the instructor. W
352. **Russian Novel III.** 4 hours. Continues Russian 351. Development from 1900 to the present: Gorkii, Sologub, Zamiatin, Fedin, Leonov, Pilniak, N. Ostrovskii, Sholokhov, A.N. Tolstoi, Ehrenburg, Dudintsev, Pasternak, Bulgakov, Solzhenitsyn. Prerequisites: Junior standing or consent of the instructor, and 12 hours of Russian. S
360. **Survey of Russian Drama.** 4 hours. Major authors from the beginning of the Enlightenment to the end of the nineteenth century: Sumarokov, Fonvizin, Ozerov, Griboyedov, Pushkin, Gogol, Turgenev, Ostrovsky, A. Tolstoy, L. Tolstoy, Chekhov, Gorky. Prerequisite: Russ. 224 or Spch. 122 or consent of the instructor. F

SOCIOLOGY (Soc)

100. **Introduction to Sociology.** 4 hours. Analysis and description of the structure and dynamics of human society. The application of scientific methods to the observation and analysis of social norms, groups, intergroup relations, social change, social stratification, and institutions.
130. **Society and Individual Development.** 4 hours. Credit is not given for Sociology 130 if the student has credit in Psychology 115. Social Psychology: role theory, influence of language in personality development and social behavior. Prerequisite: Soc. 100.
131. **Social Problems.** 4 hours. Sociological aspects of some of the more important modern social problems; social interrelationships and culture conflicts involved in their genesis, significance, and amelioration or prevention. Prerequisite: Soc. 100.

185. **Introduction to Social Science Research Methods.** 4 hours. Same as Geography 182. The application of statistical methods in social science. Topics include research design and the role of statistics in sociological investigation, measures of central tendency and dispersion, simple correlation techniques, contingency analysis, interpretation of survey findings, and introduction to statistical inference. One hour per week of laboratory work in data analysis. Prerequisite: Soc. 100 or 8 hours of geography or 8 hours of sociology or consent of the instructor.
197. **General Education Colloquium in Sociology.** 4 hours. May be repeated for credit with consent of the instructor. Special topics designed to serve for purposes of general education. Prerequisite: Soc. 100.
215. **Collective Behavior.** 4 hours. Crowds and diffuse collectivities; collective processes such as panics, crazes, and hostile mobs; the relationship between societal conditions and occurrence of these processes; the relationship of collective behavior to social change. Prerequisite: Soc. 100.
216. **Social Movements.** 4 hours. Origins of social conflict and alienation; development and articulation of ideologies and mass organizations; consequences of success and failure of social movements and, with special emphasis, political movements. Prerequisite: Soc. 100.
225. **Racial and Cultural Minorities.** 4 hours. Sociological and social-psychological analysis of racial, religious, or other ethnic groups; consideration of some of the historical and current social problems resulting from their relationships in society. Prerequisite: Soc. 100.
231. **Criminology.** 4 hours. Same as Administration of Criminal Justice 231. The nature and extent of crime in American society; assessment and evaluation of the various factors and influences that lead to criminal behavior; various measures proposed for the control of criminal behavior. Prerequisite: 8 hours of sociology.
232. **Juvenile Delinquency.** 4 hours. Same as Administration of Criminal Justice 232. Various conceptions of the nature of juvenile delinquency and its causes; the juvenile-court movement; juvenile detention, treatment of juvenile offenders; delinquency control programs. Prerequisite: Soc. 231 or CrJ. 231.
245. **Marriage and Family.** 4 hours. The functions of marriage and the family considered in their social context; special reference to mate selection, socialization and adjustment to marital roles, and phases of the family life cycle. Prerequisite: Soc. 100 or consent of the instructor.
246. **The Sociology of Religion.** 4 hours. Analysis of the structures and functions of religious institutions, particularly as found in modern society. Special attention to the interplay between religion and other social phenomena such as economics and politics; the social-psychological aspects of religious behavior; current trends in religious institutions. Prerequisite: Soc. 100.

262. **Sociological Analysis I. 4 hours.** Fundamental procedures of social research and their application to sociological problems. Critical analysis of current research in sociology. Laboratory practice in research procedures. Prerequisite: Soc. 185.
263. **Sociological Analysis II. 4 hours.** Continues Sociology 262. Analysis and interpretation of sociological data. Introduction to multivariate analysis, scale construction, and sociometric analysis. Critical analysis of special problems in sociology. Laboratory practice in research procedures. Prerequisite: Soc. 262.
271. **Population and Human Ecology. 4 hours.** A general introduction to population characteristics and trends in population dynamics—fertility, mortality, and migration. Prerequisite: Soc. 100 or the equivalent.
276. **The Sociology of Urban Life in Industrial Society. 4 hours.** Life conditions in the modern city as they are affected by the institutions in a rapidly changing industrial society. Prerequisite: Soc. 100.
287. **Senior Seminar I. 2 hours.** No credit is given in Sociology 287 until completion of 288. Students report to the seminar on current research and developments among sociologists and submit to questions, criticism, and evaluation of their reports. Prerequisites: Sociology major, senior standing, and all-University 4.00 average.
288. **Senior Seminar II. 2 hours.** Continues Sociology 287. Students report to the seminar on current research and developments among sociologists and submit to questions, criticism, and evaluation of their reports. Prerequisite: Soc. 287.
297. **General Education Colloquium in Sociology. 4 hours.** May be repeated for credit with consent of the instructor. Special topics designed to serve for purposes of general education for upperclassmen. Prerequisite: Junior standing and Soc. 100.
299. **Honors Course. 2 to 6 hours.** May be repeated with the permission of the department. Individual study of research projects. Prerequisites: Major in sociology, senior standing, all-University 4.00 average and approval of the department.
303. **Sociological Statistics. 4 hours.** Introduction to statistical tests of sociological hypotheses; estimation procedures; selected statistical procedures commonly used in sociology. Prerequisite: Soc. 263 or consent of the instructor.
315. **Advanced Social Psychology. 4 hours.** Individual projects are required. Same as Psychology 310. Critical analysis of empirical research on social perception, communication and influence, group structure, role analysis, and socialization processes. Prerequisites: Soc. 185 or Psch. 243 and 16 hours in sociology or psychology.
316. **Adult Socialization. 4 hours.** Socialization as a process of induction into new roles which occurs throughout the life cycle; the process is analyzed both at a social-psychological and a social-systems level with illustrations from various settings, such as marriage and family, illness, migration, and particularly socialization into occupations and professions. Prerequisite: 8 hours of sociology at the 200 or 300 level.

317. **Social Psychology of Theater.** 4 hours. Same as Speech and Theater 317. Compares social-psychological theories which are explicitly dramaturgical and theories of drama which are explicitly social. Considers dramatic works as social-psychological events. Prerequisite: Soc. 130 or Psch. 115 or consent of the instructor.
320. **Sociology of Mass Communications.** 4 hours. Sociological analysis of the mass media of communication; empirical studies of the impact of the media on American society and culture; impact of television on children; effects of the media upon attitudes and opinions; processes by which news is created and transmitted. Prerequisite: 4 hours of upper-division sociology, or Soc. 100 and Psch. 113.
325. **Age Groups and the Social Order.** 4 hours. The relation of age groups to social structure; the demographic, sociological, and social-psychological conditions affecting the salience of age as a basis of social organization; recent writings on adolescents and youth; the theory of subcultures as applied to youth groups; relations between generations; current directions in the study of youth groups, both conventional and deviant. Prerequisite: 4 hours of upper-division sociology.
341. **Social Stratification and Classes.** 4 hours. Nature and systems of differentiation and ranking in societies, emphasis on the class structure in the United States; life chances, prestige, status, power, and social mobility in the United States and other societies. Prerequisite: 8 hours of upper-division sociology.
343. **Sociology of Education.** 4 hours. The relationship of the educational system to the social structure, major emphasis on the role of education in an advanced technological society. Prerequisite: 8 hours of sociology.
344. **Industrial Sociology.** 4 hours. Analysis of industrial society and industrial institutions; the meaning of work and work relations and of the relationship between work and authority, with cross-cultural emphasis; sociological analysis of collective bargaining and of the impact of industrial and labor organizations on the community and on society. Prerequisite: 8 hours of sociology.
345. **The Sociology of the Family.** 4 hours. The family as a social institution; its origin, its nature of kinship, its development, and its prospects. Prerequisite: 8 hours of sociology.
346. **Sociology of Science.** 4 hours. Organizations of the scientific enterprise; emergence of science as a social institution; interrelations with other institutions such as government, religion, economy, and the arts. Science as a social phenomenon; regularities in scientific behavior; consideration of both historical and contemporary material. Prerequisite: 8 hours of sociology.
347. **Sociology of Complex Organizations.** 4 hours. Characteristics of business, government agencies, schools, hospitals, and other large-scale organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. Prerequisites: Senior standing and 8 hours of sociology, or consent of the instructor.

348. **Military Institutions in American Society. 4 hours.** Analysis of military institutions as components of the larger society; recruitment and socialization processes, behavior patterns in military organizations, paramilitary groups, and patriotic societies. Prerequisite: 12 hours of sociology or political science.
349. **Sociology of Occupations and Professions. 4 hours.** Theoretical and empirical analysis of the occupational structure and occupational mobility processes in American and other industrial societies; patterns of recruitment and retention in occupations and professions. Prerequisite: Soc. 263 or consent of the instructor.
351. **Medical Sociology. 4 hours.** Sociological contributions to medicine and public health; social organization and the organization of health services; the sociology of illness. Prerequisite: 8 hours of upper-division sociology.
361. **Social Gerontology: Old People in America. 4 hours.** The aged: demographic trends, economic status, physical and social needs, family relationships. Prerequisite: 8 hours of upper-division sociology.
365. **The Sociology of Politics. 4 hours.** Sociological interpretation of leadership, citizen participation, and the development of political organizations, using comparative materials from the United States and other countries. Prerequisite: 12 hours of sociology or consent of the instructor.
366. **Community Power Structure. 4 hours.** Analysis of the power structure of American communities; special emphasis on the relation between theoretical assumptions and research procedures in current community studies. Prerequisite: 12 hours of sociology or consent of the instructor.
371. **Population I. 4 hours.** Primarily for sociology majors and graduate students. The measurement and study of major trends and differentials in fertility, mortality, population growth, and age-sex composition in the United States and other countries. Emphasis on social and cultural determinants and consequences. Prerequisite: 12 hours of sociology, including Soc. 185 or the equivalent.
372. **Population II. 4 hours.** The measurement and study of major trends in migration, population composition, marriage and divorce in the United States and other countries; theories and policies regarding population growth in relation to resources; population forecasting. Prerequisite: Soc. 371.
373. **Human Ecology. 4 hours.** The relationship between man and the natural environment. Emphasis on the importance of population patterns and human institutions in adaptation. Prerequisite: 12 hours of sociology, including Soc. 185 or the equivalent, or consent of the instructor.
376. **Urban Sociology. 4 hours.** Review and analysis of recent research on urban areas, including their social organization, culture and subcultures, institutions, and contemporary problems. Prerequisites: Soc. 263 and 276.
385. **History of Sociological Theory. 4 hours.** The major theoretical systems that have developed in the field, beginning with the foundations in philosophical and

scientific thought before Comte and proceeding to some of the contemporary representatives in the field. Prerequisite: Soc. 263 or 8 hours of sociology.

389. **Independent Study.** 2 to 12 hours. Supervised study projects for graduate students and honors undergraduates: may consist of extensive readings in specialized areas of sociology or empirical research. Prerequisites: Soc. 263, 20 hours of sociology, and approval of the department.
390. **Strategies of Research Design and Analysis.** 4 hours. The nature of sociological research; formulation of researchable problems; alternative research designs and procedures of data collection and analysis. Prerequisite: Soc. 263 or graduate standing.

SPANISH (Span)

100. **Intensive Elementary Spanish.** 8 hours. Two additional hours per day in the language laboratory. Special accelerated course, equivalent to Spanish 101 through 102.
101. **Elementary Spanish.** 4 hours. Two additional half hours per week in the language laboratory. For students without credit in Spanish. Oral practice, reading, and grammar. W, S, Su, F
102. **Elementary Spanish.** 4 hours. Two additional half hours per week in the language laboratory. Continues Spanish 101. Prerequisite: Span. 101 or the equivalent. W, S, Su, F
103. **Elementary Spanish, 4 hours.** Two additional half hours per week in the language laboratory. Continues Spanish 102. Prerequisite: Span. 102 or the equivalent. W, S, Su, F
104. **Intermediate Spanish.** 4 hours. Two additional half hours per week in the language laboratory. Rapid reading, grammar review, composition, conversation. Prerequisite: Span. 103 or two years of high school Spanish. W, S, Su, F
105. **Intermediate Spanish.** 4 hours. Continues Spanish 104. Prerequisite: Span. 104 or the equivalent. W, S, Su, F
106. **Intermediate Spanish.** 4 hours. Continues Spanish 105. Prerequisite: Span. 105 or the equivalent. W, S, Su, F
110. **Intensive Elementary/Intermediate Spanish.** 8 hours. Two additional hours per week in the language laboratory. Continues Spanish 100. Special accelerated course; work is equivalent to that in Spanish 103 and 104 combined. Prerequisite: Span. 100, or 102 or the equivalent.
115. **Elementary Composition and Conversation.** 2 hours. Difficulty level: Spanish 104 through 106. May be taken concurrently with Spanish 105 or 106. Does not

count toward the major in Spanish. Prerequisite: Span. 104 or two years of high school Spanish.

120. **Intensive Intermediate Spanish.** 8 hours. Two additional hours per week in the language laboratory. Continues Spanish 110. Special accelerated course; work is equivalent to that in Spanish 105 and 106 combined. Prerequisite: Span. 110, or 104 or the equivalent.
187. **Masterpieces of Spanish Literature in English Translation.** 4 hours. Same as Humanities 187. Not open to Spanish majors. F
199. **Alternate Course in Spanish.** 1 to 12 hours. May be repeated for credit up to 12 hours. Special remedial course: rapid revision and particular skill development, such as in reading, writing, and speaking; special cases involving learning difficulties.
211. **Intermediate Composition and Conversation.** 3 hours. Prerequisite: Span. 106 or four years of high school Spanish. W, S, Su, F
212. **Intermediate Composition and Conversation.** 3 hours. Continues Spanish 211. Prerequisite: Span. 211 or the equivalent. W, S, F
213. **Intermediate Composition and Conversation.** 3 hours. Continues Spanish 212. Prerequisite: Span. 212 or the equivalent. W, S, F
214. **Advanced Composition and Conversation.** 3 hours. Prerequisite: Span. 213 or the equivalent. Su, W, S, F
215. **Advanced Composition and Conversation.** 3 hours. Continues Spanish 214. Prerequisite: Span. 214 or the equivalent. W, S, F
216. **Advanced Composition and Conversation.** 3 hours. Continues Spanish 215. Prerequisite: Span. 215 or the equivalent. W, S, F
217. **Spoken Spanish.** 3 hours. Exclusively oral-aural. Prerequisite: Span. 213 or the equivalent.
218. **Spanish Literature to 1700.** 3 hours. Highlights of Spanish literature from its beginning through the seventeenth century. Prerequisite: Span. 106 or the equivalent. Su, S, F
219. **Spanish Literature from 1700 to 1900.** 3 hours. Continues Spanish 218. Prerequisite: Span. 106. W
221. **Spanish Literature of the Twentieth Century.** 3 hours. Continues Spanish 219. Highlights of the twentieth century. Prerequisite: Span. 106 or the equivalent. F, W, S, Su
222. **Introduction to Spanish Literature and Criticism.** 3 hours. Required for Spanish majors. Introduction to critical techniques in various literary genres and an

historical perspective to the previous three-term introductory survey of Spanish literature. Prerequisite: Span. 221.

223. **Spanish-American Fiction of the Twentieth Century. 3 hours.** Readings in contemporary Spanish-American novelists and short story writers. Prerequisite: Span. 106 or four years of high school Spanish. F, S, W
224. **Spanish-American Fiction of the Twentieth Century. 3 hours.** Continues Spanish 223. Prerequisite: Span. 223. W, F, S
231. **Hispanic Culture: Spain. 3 hours.** Required for teacher education majors in Spanish. Considers the cultural aspects of Spanish civilization. Prerequisite: Any 200-level literature course or consent of the instructor.
232. **Hispanic-American Culture. 3 hours.** Required for teacher education majors in Spanish. Considers the cultural aspects of Spanish-American civilization. Prerequisite: Any 200-level literature course or consent of the instructor.
240. **Spanish Literature in Translation. 3 hours.** Not open to majors or minors in Spanish nor to any one with credit in Spanish courses above the 200 level. The major works from the *Cid* to the end of the nineteenth century. Prerequisite: Sophomore standing or consent of the instructor. F
241. **Spanish Literature in Translation. 3 hours.** Not open to Spanish majors or minors, nor to anyone with credit in Spanish courses above the 200 level. Major works from 1898 to the present. Prerequisite: Sophomore standing or consent of the instructor. W
242. **Spanish-American Literature in Translation. 3 hours.** Not open to Spanish majors or minors nor to anyone with credit in Spanish courses above the 200 level. Major works from the beginning of Spanish-American literature to the present; emphasis on the nineteenth and particularly the twentieth century. Prerequisite: Sophomore standing or consent of the instructor. S
252. **Advanced Grammar. 3 hours.** Required for teacher education majors in Spanish. Systematic study of syntactic and morphological problems. Prerequisites: Span. 213 and any 200-level literature course.
253. **Advanced Grammar. 3 hours.** Required for teacher education majors in Spanish. May be taken concurrently with Spanish 252. Continues Spanish 252. Prerequisites: Span. 213 and any 200-level literature course.
280. **Teachers Course. 3 hours.** Required for teacher education majors in Spanish. Various theories and approaches regarding the learning of a second language Evaluation of current materials and textbooks. Teaching demonstrations in classroom situations. Prerequisite: Junior standing and four 200-level Spanish courses.
281. **Teachers Course. 3 hours.** Required for teacher education majors in Spanish. Continues Spanish 280. Recent developments in the teaching of Spanish; modern

foreign language testing, use of audio-visual media, operation of a language laboratory, preparation of audio and video tapes. Prerequisite: Span. 280 or consent of the instructor.

291. **Senior Thesis.** 2 hours. May be repeated for a maximum of 6 hours. For candidates for honors in Spanish. Prerequisite: Honors status.
299. **Independent Study.** 1 to 6 hours. Open only to Spanish majors. Prerequisite: Consent of the instructor. W, S, F, Su
301. **Contemporary Spanish Poetry.** 4 hours. From Modernism to the present time. Readings and interpretation of the works of some of the best known poets of the period. Prerequisites: Span. 219 and 221.
302. **Contemporary Spanish Theater.** 4 hours. Plays of some of the best known contemporary authors, from Benavente to Sastre. Prerequisite: Span. 221.
303. **Nineteenth Century Spanish Non-Romantic Drama.** 4 hours. Representative outlines of non-romantic plays, their characteristics and development. Prerequisites: Span. 218 and 219, or 221 and 222.
305. **Spanish Romanticism.** 4 hours. Representative works of the Romantic period; particular emphasis on Romantic drama and poetry. Prerequisites: Span. 218 and 219, or 221 and 222.
306. **Romanticism and Realism in Nineteenth Century Spanish Literature.** 4 hours. Continues Spanish 305. Prerequisite: Span. 305.
307. **The Generation of 1898.** 4 hours. Representative works of Baroja, Azorin, Unamuno, Maeztu, Valle Inclan, Benavente, A. Machado, and others. Prerequisites: Span. 218 and 219 or 221 and 222. S
308. **Spanish-American Literature to 1888 I.** 4 hours. Development from the sixteenth century through the end of the Romantic period. Prerequisite: Span. 224 or the equivalent.
309. **Spanish-American Literature to 1888 II.** 4 hours. Continues Spanish 308. Prerequisite: Span. 308.
310. **Modernismo and Contemporary Spanish-American Poetry.** 4 hours. From 1888 to the present; some *Modernista* prose. Prerequisite: Span. 224 or the equivalent.
311. **Modernismo and Contemporary Spanish-American Poetry.** 4 hours. Continues Spanish 310. Prerequisite: Span. 310. W
314. **Poetry of the Golden Age.** 4 hours. Development of Spanish lyric poetry out of both popular and classical sources. *Romances*, Renaissance poetry, mystic poetry, *Culteranismo*, *conceptismo*. Prerequisite: Span. 218.
315. **Drama of the Golden Age.** 4 hours. Development of Spanish theater in the Golden Age; detailed study of plays by Lope de Vega, Tirso de Molina, Calderon, and other representative dramatists. Prerequisite: Span. 218.

317. **Prose of the Golden Age. 4 hours.** Major examples of picaresque, pastoral, and chivalric forms. Prerequisite: Span. 218.
318. **Minor Works of Cervantes. 4 hours.** Prose works of Cervantes and their relationship to his masterpiece. Prerequisite: Span. 317.
319. **Don Quijote. 4 hours.** Reading and discussion; emphasis on novelistic technique and development of the novel. Prerequisite: Span. 318.
320. **The Contemporary Spanish Novel. 4 hours.** Development since 1936. Prerequisites: Span. 218 and 219 or 221 and 222 or the equivalents.
321. **The Contemporary Spanish Novel. 4 hours.** Continues Spanish 320. Prerequisite: Span. 320. W
323. **The Contemporary Spanish-American Novel I. 4 hours.** From the Romantic period to 1930. Prerequisite: Span. 224 or the equivalent.
324. **The Contemporary Spanish-American Novel II. 4 hours.** Continues Spanish 323. From 1930 to the present. Prerequisite: Span. 323.
340. **History of the Spanish Language. 4 hours.** General survey of the development of the Spanish language. Prerequisites: Span. 213 and 218 or the equivalents.
342. **Introduction to Romance Philology. 4 hours.** History of the Romance languages, especially Spanish, French, Italian, and Portuguese, from the Classical Latin period to the present; their external history, phonology, morphology, and syntax. Prerequisites: Span. 218 and two years of college-level French or consent of the instructor.
345. **Medieval Spanish Literature. 4 hours.** Important works from the beginnings to 1400. Prerequisite: Span. 218. Span. 340 is recommended.
346. **Medieval Spanish Literature. 4 hours.** Important works of the fifteenth century. Prerequisite: Span. 218. Span. 340 is recommended.
349. **Phonetics. 4 hours.** Prerequisites: Span. 213 and 218 or 221.
371. **Spanish for Teachers. 4 hours.** Consideration of those language problems suggested by teaching experience. It is recommended that this course be taken after student teaching, in the last quarter before graduation. Also open to experienced teachers. Prerequisite: Student or professional teaching experience.
390. **Topics in Spanish Literature. 6 hours.** Topics vary from quarter to quarter. Prerequisite: Span. 306 or consent of the instructor.

SPEECH AND THEATER (Spch)

100. **Principles of Effective Speaking. 3 hours.** Students must register for a lecture and a recitation section. Analysis of contemporary speechmaking theory; emphasis on

message selection, analysis, structuring, and support; audience analysis and adaptation; language; examination of principles of delivery. F, W, S, Su

101. **Effective Speaking.** 2 hours. Application of the principles of effective speech-making. Practice in the preparation and presentation of short speeches. Prerequisite: Spch. 100 or consent of the instructor. F, W, S, Su
102. **Principles of Effective Speaking.** 4 hours. Prerequisite: James Scholar or Dean's List status or speech major or consent of the department.
107. **Parliamentary Procedure.** 2 hours. Principles and practice. F, W, S, Su
111. **Foundations of Communication Theory.** 4 hours. The development of communication theory from Plato and Aristotle to the twentieth century. Consideration of concepts, including relationships between societal needs and communication theory, free speech, development of parliamentary institutions, and fundamental communication principles. F, W, S
112. **Interpersonal Communication Theory.** 4 hours. Cognitive, linguistic, and physical processes in communication. Communication models, cognitive dissonance, language behavior, feedback and channels. F, W, S
113. **Mass Communications Theory.** 4 hours. The nature of mass communications; particular consideration of major concepts, including communication technology and societal change, information transmission and diffusion, content analysis and the measurement of effects, the institutionalization of mass communications, freedom and responsibility in public and private channels, and the relationship of mass communications to mass culture. W, S
121. **Introduction to the Theater.** 4 hours. The nature and elements of theater—the theories, styles, and semantics of theater arts. F, W, S, Su
122. **Survey of Theater History.** 4 hours. Introduction to the major historical periods of the development of the theater and drama from ancient Greece to the present. Prerequisite: Spch. 121. W, S
123. **Contemporary Theater.** 4 hours. Critical and analytical study of current theater productions based upon modern literary, production, and performance standards. Students will attend and analyze several currently produced plays in the Chicago area. Prerequisite: Spch. 121. F, W, S
131. **Survey of Contemporary Broadcasting.** 4 hours. Introduction to the history, structure, operation and impact of American broadcasting and its relation to other media and institutions in our society. Prerequisite: Sophomore standing.
141. **Oral Interpretation of Literature.** 4 hours. Oral reading for understanding, appreciation, and communication. F, W, S, Su
151. **Introduction to Technical Theater.** 4 hours. A lecture-laboratory approach to the basic techniques of play production. Survey of historical background and sources,

theories, styles, methods and materials of scene design, stage lighting, costuming, and makeup. Lectures, readings, and practical problems. Prerequisite: Spch. 121. F

171. **Principles of Speech Development and Correction. 4 hours.** An introductory course that considers the development, role, and structure of language. Designed to assist the teacher in identifying and recognizing the child handicapped in speech and language. Discussion of the nature, causes, and therapeutic methods for such handicaps. Clinical observations. F, S
180. **Speech Variation in Urban Areas I. 4 hours.** The development, causes, roles, and structure of urban speech variation; emphasis on Black English. A lecture-laboratory approach to the aspects of multi-dialectal behavior; theories, styles, conflicts. Systematic examination of, and practice in, cross-cultural speech.
181. **Speech Variation in Urban Areas II. 4 hours.** The relationship of ethnolinguistics and aspects of cross-cultural communicative competence. Aspirational and attitudinal factors in language maintenance. Conflicting value systems reflected in speech behavior. Examination of the concepts of superposed standard as a toll language, and self-group identity in language interchange. Lecture-practicum. Prerequisite: Spch. 180.
195. **Advanced Voice Training. 3 hours.** Designed to develop in the individual student's voice a wide range of control in pitch, volume, and quality to meet extraordinary voice and speech demands in broadcasting, interpretation, public address, teaching, and theater. Prerequisite: Voice proficiency test, administered by the instructor. W
201. **Bases of Speech. 4 hours.** The social, physical, physiological, neurological, phonetic, linguistic, psychological, genetic, and semantic bases of speech. W
202. **Fundamentals of Phonetics. 4 hours.** Phonemics and phonetics; emphasis on pronunciation characteristics of American English, ear training, and practice in transcription. F, S
203. **Anatomy and Physiology of the Speech Mechanism. 4 hours.** Anatomical and physiological characteristics of the normal speech-and-hearing mechanisms; physiology of speech production. Prerequisite: Spch. 201 or 202 or consent of the instructor.
204. **Speech Science. 4 hours.** Voice and speech as related to the physiology of the speech act, acoustics, and the hearing of speech. Prerequisite: Spch. 201 or 202 or consent of the instructor.
210. **Statistics in Communications Research. 4 hours.** Credit is not given for Speech and Theater 210 if the student has credit in Quantitative Methods 171 or Sociology 185 or Geography 185 or Psychology 243. The role of statistics in communication research; the nature of research design; the basic concepts of measurement scales, distributions, parameters, hypothesis testing; methods of assessing differences; methods of assessing relationships. Examples will be drawn from communication research. Prerequisites: Spch. 112 and 113 or consent of the instructor.

211. **Discussion. 4 hours.** Study and practice in the theories and techniques of group discussion; the nature of small-group decision making; discussion as a learning technique. Prerequisite: Spch. 112. S
212. **Argumentation. 4 hours.** The theory of argumentation; evidence, reasoning, and refutation; historical and contemporary debates and argumentative discourse; practice in argumentative speaking. F
213. **Persuasion. 4 hours.** Principles of attitude change, including theories of persuasion and audience analysis. Practice and experimentation in persuasive speaking. Prerequisites: Spch. 111, 112, and 113; or 215; or consent of the instructor. W, Su
215. **Psychology of Attitude and Opinion. 5 hours.** Same as Psychology 215. Survey of behavioral approaches to the measurement of social attitudes and opinions; determinants and correlates of public attitudes and opinions. Lecture and participation in field and laboratory studies. Prerequisite: 8 hours of psychology or consent of the instructor for well-qualified speech majors. F
231. **Television and Radio Performance. 4 hours.** Development of the basic skills for effective dramatic and nondramatic television and radio performance; announcing, interviewing, and acting. Special attention is given to individual performance problems. Lecture and laboratory. Prerequisite: Spch. 113 or consent of the instructor. F
232. **Television and Radio Production. 4 hours.** Lecture and laboratory course designed to teach advanced production techniques for radio and television. Students are exposed to a variety of radio and television production situations. Prerequisite: Spch. 131 or consent of the instructor. W
233. **Television and Radio Directing. 4 hours.** Designed to develop style and skill in television and radio directing; special attention to script analysis, staging, pictorial composition, audio placement and integration, control room operation, crew management, and rehearsal procedures. Prerequisite: Spch. 232. S
239. **Mass Communication Practicum. 5 hours.** Professional studies in the mass media. Students work in Chicago-area radio and television stations. The nature of work is determined in consultation with the department and the station involved. Limited to a few advanced students in mass communications on the basis of written applications submitted one quarter in advance. Prerequisite: Approval of the head of the department.
241. **Advanced Oral Interpretation. 4 hours.** Literary analysis of poetry, prose, and drama; platform presentation of literary materials. Prerequisite: Spch. 141. W, S, Su
251. **Advanced Technical Theater. 4 hours.** Advanced techniques of play production. Fundamentals of scene design, lighting, and costuming, such as illusion techniques, ornamentation, use of color; techniques of rendering, plotting, and sketching. Practical work with University Theatre. Prerequisite: Spch. 151. W

261. **Fundamentals of Acting.** 4 hours. Methods of acting; emphasis on basic stage techniques and the role of the character in relation to the intellectual and emotional values of the play. Prerequisites: Spch. 121 and 141 or consent of the instructor. F
262. **Advanced Acting.** 4 hours. Study and practice of modern realistic and nonrealistic acting techniques. Development and performance of a full-length characterization. Prerequisite: Spch. 261 or consent of the instructor. W
264. **Fundamentals of Stage Directing.** 4 hours. Principles and techniques of the director's art. Fundamentals of staging: blocking, movement, business, tempo: Script analysis and rehearsal planning. Specific projects in directing scenes. Prerequisites: Spch. 121 and 261.
265. **Advanced Stage Direction.** 4 hours. Procedures for developing a creative relationship between director and actor in interpreting a play in rehearsal; historical consideration of directional methods. Class analysis of problems of interpretation and stage management; assignment of scenes to demonstrate dramatic values. Prerequisite: Spch. 264. S
295. **Secondary School Speech Curriculum.** 4 hours. Designed to equip the prospective speech teacher with the objectives, principles, and methods of teaching speech arts in the secondary school. Prerequisites: Junior standing and 16 hours of speech courses.
298. **Honors Course: Individual Study.** 3 hours. May be repeated for a maximum of 6 hours. Individual study leading to a thesis to complete requirements for distinction in the Department of Speech and Theater. Prerequisites: 24 hours of speech and theater, 4.00 grade-point average, and consent of the head of the department. F, W, S
299. **Individual Topics.** 3 hours. May be repeated for a maximum of 6 hours. Individual investigation of special problems. Prerequisites: 10 hours of speech and theater, 3.75 grade-point average, and consent of the head of the department. F, W, S
301. **Communication Analysis.** 4 hours. Descriptions, models, proposed dimensions, and statistical treatment of the communication process. Prerequisites: Spch. 112, 113, 201 or 202, and 210 or consent of the instructor.
302. **Group Communication Theory.** 4 hours. Detailed analysis and observation of group processes from the viewpoint of modern information and field communication theory. Prerequisites: Spch. 111, 112, 113, 210 and 211 or consent of the instructor.
303. **Theories of Language Performance.** 4 hours. Contemporary theories and related research in language performance, centering upon selected approaches to language acquisition and behavior; special emphasis on the psycholinguistic approach. Prerequisites: Spch. 112, 201 or 202 and 210 or the equivalent or sufficient language-linguistics background.

311. **American and British Public Address I.** 4 hours. Critical and historical study of American and British speakers and their speeches to 1850. Prerequisites: Spch. 111, 112, 113 and any two of Spch. 211, 212, 213 or consent of the instructor.
312. **American and British Public Address II.** 4 hours. Continues Speech and Theater 311. From 1850 to 1920. Prerequisites: Spch. 111, 112, 113 and any two of Spch. 211, 212, 213 or consent of the instructor. F
313. **Contemporary Public Address.** 4 hours. Study of contemporary speechmaking; principal focus on issues relating to economics and government, World War II, postwar international problems, and civil rights. Prerequisites: Spch. 111, 112, 113 and any two of Spch. 211, 212, 213 or consent of the instructor. W
315. **The Rhetoric of Free Speech.** 4 hours. The rhetorical processes employed by those speakers in the British House of Commons and in America who participated in the freedom of speech movements. Consideration is given to issues relating to the contemporary American scene. Prerequisites: Spch. 212 and PolS. 355 or consent of the instructor.
317. **Social Psychology of Theater.** 4 hours. Same as Sociology 317. Compares social psychological theories which are explicitly dramaturgical and theories of drama which are explicitly social. Considers dramatic works as social psychological events. Prerequisite: Soc. 130 or Psych. 115 or consent of the instructor.
321. **European Theater History I.** 4 hours. Historical survey of the theater and theater arts of ancient Greece and Rome, medieval Europe, the Italian Renaissance, and Elizabethan England. Prerequisites: Spch. 122 and at least 8 hours of credit chosen from Spch. 241, 251, 261, 262, 264, and 265. W
322. **European Theater History II.** 4 hours. Historical survey of the theater and theater arts from the seventeenth century to modern times in Europe and England. Prerequisites: Spch. 122 and at least 8 hours of credit chosen from Spch. 241, 251, 261, 264, and 265. S
324. **American Theater History I.** 4 hours. Development of the American theater from 1700 to 1914; historical trends and dramatic literature. Prerequisites: Spch. 122 and at least 8 hours of credit chosen from Spch. 241, 261, 262, and 264 or consent of the instructor.
325. **American Theater History II.** 4 hours. Development of the American theater from 1914 to the present; native and European influences in determining theatrical trends. Prerequisites: Spch. 122 and at least 8 hours of credit chosen from Spch. 241, 261, 262, and 264 or consent of the instructor. F, Su
327. **Playwriting.** 4 hours. An introductory course in the writing of drama as a distinctive mode of expression intended for theatrical performance. The nature of the theatrical experience and dramatic action through the basic elements of plot, character, theme, dialogue, mood, and spectacle. Specific writing exercises and satisfactory completion of an original one-act play. Prerequisites: Junior standing and Spch. 122 and 123 or consent of the instructor.

328. **Play Production Prospectus.** 4 hours. Seminar; emphasizes the stage director's central function in creating an artistic concept for producing a play and coordinating all elements of performance in an aesthetic unity. Historical research of a recognized dramatic classic and preparation of a complete production book. Prerequisites: Spch. 251, 264, and 265 or consent of the instructor.
329. **Theatrical Criticism.** 4 hours. Seminar in the study and practice of theatrical criticism, principally modern and contemporary criticism. Historical bases of critical judgment of play and performance; function and influence of the critic in establishing artistic standards and cultivating public taste. Preparation of criticisms of current productions. Prerequisites: Spch. 122, 123, 261 and 264 or consent of the instructor. W
331. **Mass Media Programming.** 4 hours. Mass media program types, objectives, methods, and effects; creative development of programs from conception to script. Prerequisites: Two courses in speech including Spch. 232. F
333. **Mass Communications Seminar.** 4 hours. Intensive study of the nature of mass media in contemporary society. The legal and social responsibilities of mass media institutions in the United States and abroad. Prerequisites: Two courses in speech including Spch. 131.
351. **Scene Design and Lighting.** 4 hours. A lecture-laboratory approach to the role of stage lighting in scene design. Analysis of historical background and sources; special emphasis on such areas as theories, psychological and aesthetic factors, and lighting application techniques and equipment. Lectures, readings, and practical problems. Prerequisite: Spch. 251 or consent of the instructor.
354. **The Psychology of Language.** 4 hours. Same as Linguistics 354 and Psychology 354. Introductory survey of methods, theory, and research; acquaints students with the history and present status of psychology's interest in language behavior. Prerequisite: Consent of the instructor.
361. **Periods and Styles of Acting.** 4 hours. Concentration on premodern styles of acting from these periods: classic Greece, *commedia dell' arte*, Elizabethan, Restoration and the eighteenth century, nineteenth century melodrama, and naturalism. Prerequisite: Spch. 262 or consent of the instructor. S
371. **Advanced Study in Language.** No credit. Intensive study of the language and speech activities of elementary school children; particular attention to language-disabled children. Includes the study of language acquisition and applicable speech activities. Prerequisite: Baccalaureate degree from an accredited institution.
397. **Proseminar in Speech and Theater.** 4 hours. Examination of research trends and methodologies appropriate to the area. Prerequisites: Graduate standing and 30 hours of credit in speech and theater.

SPEECH FOR FOREIGN STUDENTS (SpchF)

103. **Speech for Foreign Students. 0 hours.** Sounds and intonation patterns of American English; relation of sound to spelling. Drill sessions designed to improve the student's ability to speak and understand English at normal conversational speed. Prerequisites: Reading knowledge of English; ability to understand instructions.
104. **Speech for Foreign Students. 0 hours.** English pronunciation for students whose native language is not English. Sounds and intonation patterns of American English; designed to improve the student's ability to speak at a normal conversational pace. Pronunciation material similar to that in Speech for Foreign Students 103 but for more advanced students. Prerequisite: SpchF. 103 or consent of the instructor.

STUDENT COUNSELING SERVICE (SCS)

101. **Reading Improvement. No credit.** For students who wish to increase their reading rate or improve their vocabulary and comprehension skills.
102. **Study Skills Improvement. No credit.** For students who need to develop more effective study methods. Through discussion and group interaction, students are helped to clarify their purposes and goals and to improve concentration and study skills.
103. **Vocabulary Development. No credit.** For students who need assistance in developing language skills. Use of vocabulary in thinking and communication. Practical exercises in vocabulary building.
104. **Career Planning. No credit.** For students who wish to clarify their vocational goals. Self-evaluation of abilities, interests, and personal needs as they bear on occupational choice.
105. **Group Dynamics. No credit.** Group sessions for students who wish to develop greater awareness of themselves and their relationships with others and to become more sensitive to nonverbal forms of communication. Groups oriented toward specific topics, such as leadership training, are offered if a sufficient number of students express interest.
180. **Reading and Study Skills Improvement. 0 hours.** Restricted to students enrolled in the Educational Assistance Program in Urban Education. Improvement of reading comprehension in relation to different types of content; understanding the processes of concentration, retention of ideas, memory, and distribution of practice. Intensive application of improved methods of reading and study; elimination of ineffective approaches. Prerequisite: Consent of the instructor.

SWAHILI (Swa)

101. **Elementary Swahili I. 4 hours.** Four additional half hours per week in the language laboratory. Reading, grammar, and simple oral practice.
102. **Elementary Swahili II. 4 hours.** Four additional half hours per week in the language laboratory. Prerequisite: Swa. 101 or the equivalent.
103. **Elementary Swahili III. 4 hours.** Four additional half hours per week in the language laboratory. Prerequisite: Swa. 102 or the equivalent.

SYSTEMS ENGINEERING (SysE)

151. **Introduction to Engineering Design I. 4 hours.** Fundamentals of engineering design processes; engineering graphical problem-solving and communications; data presentation and analysis; vector analysis; technical reports; standards and conventions; spatial geometry; short creative problems and creative design projects. Prerequisites: Registration in Math. 130 and Rhet. 101 or consent of the instructor.
152. **Introduction to Engineering Design II. 4 hours.** Continues Systems Engineering 151. Design applications of engineering statics; resultants of force systems, vector algebra, and graphical analysis of force system, equilibria, moments, and centroids; case studies and design projects to develop creativity. Prerequisites: SysE. 151 and registration in Math. 131.
153. **Introduction to Engineering Design III. 4 hours.** Continues Systems Engineering 152. Practical applications of design strategies and modeling and analysis techniques to engineering systems design projects; introduction to a variety of fundamental analytic methods, such as optimization, probability and statistics, and simulation; consideration of the role of the professional engineer in society. Prerequisites: SysE. 152, Rhet. 102, and registration in Math. 132 or consent of the instructor.
221. **Graphical Calculations. 3 hours.** Graphics in space flight. Graphical analysis and computations with analytical proofs. Graphical mathematics, including graphical calculus. Graphics of empirical equations. Graphics in communications—technical charts and nomographs. Conceptual and creative design and computer-related graphics. Prerequisites: SysE. 103 or the equivalent and registration in Math. 133.
222. **Surveying I. 4 hours.** Fundamental operations. Prerequisite: Math. 250.
223. **Surveying II. 4 hours.** Introduction to precise control surveys and route alignment; elements of aerial photogrammetry. Prerequisite: SysE. 222.
230. **Transportation Systems Analysis I. 3 hours.** Introduction to analysis of transportation as general process and as man-machine system; examination of relation of transportation to other (urban) systems and subsystems, and to patterns of human activity. Characterization of general and specific transport

technologies, including hardware and control and operating strategies. Introduction to models of transportation systems and processes. Prerequisite: Math. 195.

240. **Urban Systems Analysis I. 3 hours.** Introduction to the analysis of static urban systems: studies of the physical components and subsystems of urban systems; discrete, network, and ubiquitous engineering subsystems, behavioral patterns and marker transactions; public and private activity subsystems; introduction to integrated systems studies. The analysis of the environmental consequences of complex engineering systems. Prerequisite: Math. 195.
250. **Dynamic Systems Analysis. 4 hours.** Mathematical modeling of lumped physical elements. Vector matrix formulation of linear dynamic systems. Laplace transform. State variable representation of lumped nonlinear systems. Analog and digital simulation of system equations. Prerequisites: Math. 195, InfE. 210.
271. **Introduction to Industrial Engineering I. 4 hours.** Structure and theory of industrial organization. Information processing. Mathematical models of industrial processes. Process control and automation. Reliability models. Quality control. Prerequisites: Econ. 121, credit or registration in Math. 370.
272. **Introduction to Industrial Engineering II. 4 hours.** Microanalysis of industrial processes. Flowgraphs and scheduling techniques. System simulation and game theory. Optimal decision in management. Decision making under risk and uncertainty. Industrial planning and policy development. Prerequisite: SysE. 271.
311. **Introduction to Systems Analysis I. 4 hours.** Mathematical modeling of systems described by ordinary differential equations, including electrical, mechanical, economic, ecological, industrial, and others. Fundamental laws describing generalized system elements. Topological consequences of element interconnections and solutions for elementary topologies using computer methods. Prerequisites: Math. 195 and InfE. 210.
312. **Introduction to Systems Analysis II. 4 hours.** Continues Systems Engineering 311. Lagrange's method of deriving generalized system equations. Analysis of multi-loop topologies using vector matrix forms. Solution of the general linear system using Laplace transforms and computer techniques. Prerequisite: SysE. 311.
313. **Introduction to Systems Analysis III. 4 hours.** Continues Systems Engineering 312. Feedback, stability, and frequency characteristics of generalized linear systems. Matrix transfer function forms for interacting systems. Introduction to nonlinear generalized systems. Prerequisite: SysE. 312.
321. **Distributed Systems Analysis. 4 hours.** Analysis of linear, one and two-dimensional distributed parameter systems arising in engineering, economics, industry, and transportation type systems. Equations of motion are derived from elementary differential models and analyzed using analytic and simulation techniques. Prerequisite: SysE. 311 or the equivalent.

325. **Nonlinear Systems Analysis. 4 hours.** Analysis of inherently and/or topologically nonlinear models arising in engineering, economic, and ecological systems. Energy methods are used to reduce topology to a state space model which is then analyzed using classical and computer aided techniques. Prerequisite: SysE. 313 or the equivalent.
326. **Discrete Systems Analysis. 4 hours.** Analysis of the equations of motion of physical system models using finite difference forms. Lumped linear and nonlinear systems are emphasized but, where applicable, method is extended to distributed systems. Prerequisite: SysE. 313 or the equivalent.
330. **Transportation Systems Analysis II. 3 hours.** Examination of technological components and relationships affecting the performance of transportation systems; integrated analysis of system performance and its effects on the economic, social, political, and psychological aspects of human activities. Prerequisites: SysE. 230 and credit or registration in Econ. 120.
331. **Transportation Systems Engineering. 3 hours.** Examination of fundamental physical relationships governing the operation and design of transportation systems and their components; general and specific analyses of system performance characteristics as a function of component specifications and system design. Prerequisites: Junior standing and SysE. 330, MatE. 102 or Phys. 111 or consent of the instructor.
332. **Transportation Systems Planning. 3 hours.** Philosophies, strategies, and specific analytical techniques for planning large transportation systems; analysis and critique of contemporary institutional structures and models used for transportation planning; general and specific methods of forecasting future needs, developing plans, and evaluating alternatives; application of various techniques to practical transportation planning problems. Prerequisites: SysE. 330 and credit or registration in SysE. 371.
340. **Analysis and Design of Systems I. 4 hours.** Open to a limited number of advanced undergraduate and graduate social science students. Introduction to strategic and tactical procedures for applying a variety of analytic techniques to large-scale systems; emphasis on the interaction of these systems with society. In addition to readings, lectures, and discussions, student teams undertake comprehensive design projects to gain realistic experience with analysis and design procedures. Prerequisites: Senior standing in engineering and consent of the instructor. For social science students; senior standing in their fields, background in algebra, geometry, and calculus equivalent to Math. 110 through 112, and consent of the instructor.
350. **Stochastic Processes. 4 hours.** Analysis of probabilistic systems; the theory of games and decisions; recurrent event models, markov processes, and queueing systems; digital computer simulation of stochastic processes; applications to specific engineering systems. Prerequisite: Math. 370.
352. **Experimental Design. 4 hours.** Review of fundamental concepts of statistical analysis. Introduction to standard experimental designs and their associated application in the statistical interpretation of research data and design of

engineering systems. Completely random designs, randomized block designs, Latin squares, covariance analysis, and factorial experiments. Prerequisite: Senior standing in engineering.

355. **Urban Systems Analysis II.** 3 hours. Introduction to the analysis of dynamic urban systems, urban process analysis; modeling of growth and development processes; studies of decentralized and centralized decisional systems; quantitative analysis techniques for modeling; evaluating the performance of existing and planned urban regional systems and components; analysis and evaluation of technologically based regional policies. Prerequisites: SysE. 240 and credit or registration in Econ. 120.
356. **Urban Systems Planning.** 3 hours. Introduction to philosophies, theories, strategies, and techniques of urban systems planning; studies of urban value systems and the development of operational planning objectives; planning information systems, data collection and analysis; predictive model development; plan design methods; analysis of resources allocation; plan testing and evaluation; application of specific techniques to laboratory problems. Prerequisites: SysE. 230 and 355, credit or registration in SysE. 371 and Econ. 121.
360. **Traffic Flow and Control Systems.** 3 hours. Introduction to particulate flow systems; investigation of microscopic flow relations and their effect on macroscopic flow properties; generalized study of traffic control systems; integrated investigation of flow properties, control systems, and system safety characteristics; applications to highway and air traffic flow. Laboratory work in data collection, analysis, and simulation studies. Prerequisites: Math. 195, 370, SysE. 331, and credit or registration in SysE. 350.
361. **Evaluation of Engineering Systems.** 2 hours. Strategies and techniques for evaluating complex urban and transportation systems; discussion of public works investment-decision processes, and the role of the engineer; economic, social, psychological, and political analysis of major engineering systems; market studies and simulation techniques; cost-effectiveness studies and program budgeting systems. Prerequisites: Econ. 121, SysE. 332 or 356 or consent of the instructor.
371. **Optimization Techniques I.** 4 hours. Linear programming models, Simplex method, sensitivity analysis, transportation problems, duality. Nonlinear programming models, separable objective function, geometric programming, Kuhn-Tucker equations, quadratic programming. Prerequisites: Math. 195, 220, senior standing or consent of the instructor.
372. **Optimization Techniques II.** 4 hours. Dynamic programming, optimal control theory, Bellman, Hamilton-Jacobi, and Euler-Lagrange equations, Pontryagin's maximum principle. Search techniques, golden mean and Fibonacci search, gradient approach, stochastic approximation. Prerequisite: SysE. 371 or consent of the instructor.
380. **Quantitative Methods in Urban Engineering.** 3 hours. Theory and application of fundamental statistical and mathematical techniques of measurement and data analysis for urban systems engineering; presentation and critical review of selected

quantitative methods appropriate to identifying problems, establishing design standards, and evaluating the performance of urban engineering systems. Prerequisites: SysE. 356, Math. 195 and 370.

- 381. Projects in Urban Systems Engineering.** 2 hours. Analytical and experimental projects in urban systems engineering and planning. Prerequisite: SysE. 380 and credit or registration in SysE. 350.
- 391. Seminar.** 1 to 4 hours. May be repeated. Topics to be arranged. Prerequisite: Consent of the instructor.
- 393. Special Problems.** 2 to 4 hours. Special problems and reading by arrangement with the faculty. Prerequisite: Consent of the instructor.

WORLD LITERATURE. See Humanities.

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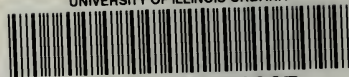
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